

**IN THE UNITED STATES DISTRICT COURT
FOR THE NORTHERN DISTRICT OF GEORGIA
ATLANTA DIVISION**

DONNA CURLING, ET AL.,)	
)	
Plaintiffs,)	
)	CIVIL ACTION
vs.)	
)	FILE NO. 1:17-cv-2989-AT
BRAD RAFFENSPERGER,)	
ET AL.,)	
)	
Defendants.)	

**PLAINTIFFS' BRIEF
ON GEMS DATABASE DISCOVERY**

Plaintiffs jointly submit this brief in response to the questions raised in the June 28, 2019 telephone conference relating to the joint discovery dispute initiated by the Coalition Plaintiffs (Doc. 416) relating to the production of GEMS databases. As explained below in Part I, the GEMS databases should be produced immediately without restriction because they are highly relevant and not confidential. State Defendants' counsel conceded this point during the June 28 teleconference, emphasizing that the GEMS databases themselves provide the "roadmap" that needs to be analyzed to identify flaws or vulnerabilities in the GEMS system. (June 28, 2019 Hearing Tr. 23:4-9, attached as Exhibit A.) As

explained in Part II, production of reports generated from the GEMS databases, without the GEMS databases themselves, would be insufficient because reports will not disclose defects in the underlying database configurations. As explained in Part III, the production of the GEMS databases is separate and distinct from the more complex production of images of the GEMS servers and should precede that production. The GEMS databases do not implicate the security concerns Defendants have raised regarding the GEMS servers and thus do not warrant the sort of security measures discussed for the servers. Neither does production of the databases involve anything like the process for producing images of the servers. The GEMS databases can—and should—be produced immediately on discs or hard drives.¹ There is no cause for further delay, which already has prejudiced Plaintiffs' ability to prepare for the July 25-26 hearing.

¹ To expedite the production of the GEMS databases as a critical first step in the analyses needed here, Plaintiffs focus here on the production of those databases rather than the forensic images of the GEMS servers. Plaintiffs are prepared to meet and confer further with Defendants further regarding the process and reasonable security measures for production of the images. If the parties cannot resolve that dispute, they will return to the Court for resolution. Obtaining the GEMS databases now likely will help resolve or at least narrow that dispute and make the issues regarding that production less abstract.

I. THE GEMS DATABASES SHOULD BE PRODUCED WITHOUT RESTRICTION

Plaintiffs seek immediate production of electronic copies of the GEMS databases for the November 6, 2018 election that the Secretary prepared for and transmitted to each Georgia county, and the corresponding GEMS databases that the Secretary received from each county after the election. (Doc. 416-1 at page 6).² This production should be prior to, and separate from, the more complicated and sensitive production of the forensic images of GEMS servers. Production of the GEMS databases first—while incomplete for the analyses needed in this case—will allow valuable (but far less expensive and time consuming) discovery to

² Plaintiffs seek pairs of GEMS databases in the Secretary possession for each of the 159 Georgia counties: the Secretary’s copies of the databases that the Secretary sent to the counties, and the Secretary’s copies of the databases that the counties returned. In discussions with the Secretary’s counsel during the June 28, 2019 telephone conference, Plaintiffs suggested reducing the number of counties to 25. The Secretary, however, explained that their objection to producing the databases is confidentiality regarding their structure, not burden, and thus there is no distinction between producing the database for one county versus all 159. June 28, 2019 Hearing Tr. 28:8-15 (“I think the important piece is we don’t see a distinction between 25 and the entire database because our concern is not the amount”).

Plaintiffs also seek from defendant Fulton County and, currently, from three third-party counties copies of *their* databases. These requests are in addition to the requests directed at the Secretary. These databases should be the same as the databases in the Secretary’s possession, and examining the extent to which they differ is a critical part of the analyses needed to evaluate security vulnerabilities and flaws in the GEMS system in this case.

proceed immediately and will allow a more efficient sequence of gathering information.

Defendants bear the burden to support their confidentiality claims regarding the GEMS databases. *In re Mentor Corp. ObTape Transobturator Sling Prod. Liab. Litig.*, 632 F.Supp. 2d 1370, 1375-76 (M.D.Ga. 2009) (citing *In re Grand Jury Investigation*, 842 F.2d 1223, 1225 (11th Cir.1987)). Plaintiffs bear no burden to prove otherwise. But Defendants have offered only vague, conclusory claims about the “structure” of the GEMS databases, without any evidentiary support. In fact, during the Court-Ordered meet-and-confer on June 28, State Defendants’ counsel questioned Plaintiffs’ experts at length—without interruption from Plaintiffs’ counsel—about their need for the GEMS databases; but State Defendants’ counsel abruptly interrupted when Dr. Halderman asked Merrit Beaver, Chief Information Officer of the Secretary of State, a simple and direct question concerning the GEMS databases and refused to allow Mr. Beaver to answer the question. Throughout the call, Mr. Beaver merely parroted counsel’s conclusory claim that the “structure” of the GEMS databases is somehow confidential. He never explained how or why this is so or provided any details to support the claim. When *Dr. Halderman* asked him what aspects of the GEMS system he would examine were he to analyze the security of the system as

Plaintiffs’ experts seek to do and whether he would rely only on what State Defendants have offered to produce, that’s when State Defendants’ counsel immediately shut down the discussion and refused to allow him to answer.³ State Defendants’ counsel evidently feared what he would have to admit (without having been prepped for the question): no reliable or reasonable analyses of vulnerabilities or flaws in the GEMS system could be performed with the paltry reports State Defendants have offered or without the GEMS databases Plaintiffs seek.

The fact is that the GEMS databases should be produced without any “confidentiality” designation because the State Defendants have not identified any confidential information that is contained in the GEMS databases.⁴ Indeed, the

³ During the June 28, 2015 conference with the Court, State Defendants’ counsel claimed that “the questions were turning into a cross-examination and a deposition of whether Mr. Beaver would concede certain points.” Hearing Tr. 22:6-9. This was surprisingly and disappointingly untrue. Dr. Halderman—rather than Plaintiffs’ counsel—asked Mr. Beaver a single, direct question aimed at understanding what Mr. Beaver would examine for the sort of security analyses Plaintiffs’ experts seek to do regarding the GEMS system. The only “cross-examination” that occurred was by Mr. Tyson of Plaintiffs’ experts, which proceeded uninterrupted. Plaintiffs’ experts have nothing to hide.

⁴ The GEMS databases that Plaintiffs seek in discovery should not contain passwords, encryption codes, or other security information, but, if they do, that information can be redacted before production.

State Defendants concede that there is no confidential data contained in GEMS databases, and instead vaguely insist that the “structure” or “architecture” of the GEMS databases is somehow confidential because it is unique to Georgia and that disclosure of the GEMS databases will somehow threaten election security. Yet the State Defendants do not explain even generally what is unique about the “structure” of Georgia’s GEMS databases (or what that even means) and do not provide any evidence or expert testimony supporting that naked assertion.⁵

In fact, the Secretary of State’s current position is directly contradicted by the sworn testimony of Merle King, the former Executive Director of Georgia’s CES. Mr. King was an expert for the government in the Pima County case, and testified that the “structure” of the GEMS databases in Georgia is consistent with that of GEMS databases all over the country:

The structure of the database is consistent through all jurisdictions that use GEMS, so the revelation of one jurisdiction's database structure reveals information -- potentially reveals information about other jurisdictions.

(Deposition of Merle King, at 11:17-21, attached as Exhibit B).

⁵ For testimony explaining the GEMS databases generally, and the issues outlined in this Brief, *see* the Declaration of Dr. Alex Halderman, attached hereto as Exhibit G.

In addition, Coalition Plaintiffs’ expert has reviewed GEMS databases from other jurisdictions (which are public records) and has found “no data” that “poses a privacy threat to voters or exploitation of the voting system by being disclosed.” (Bernhard Decl., July 1, 2019, attached as Exhibit C). In addition, Mr. Bernhard states: “The structure of the database is disclosed in GEMS manuals that have been publicly available since the system was first put in service.” (*Id.*).

While the GEMS servers—containing the GEMS *software*—may contain source code and sensitive information that needs reasonable security protection, the GEMS databases do not. A GEMS database is just a file—essentially a table—containing data. Before the election, it contains data on how ballots should be configured and votes recorded. After the election, it contains data about those votes. Because the GEMS databases are just Microsoft Access worksheets, they do not contain proprietary source code, personally identifying voter information, or other sensitive information. (*See generally* Bernhard Decl. ¶¶ 12 – 14).

Other states’ GEMS databases have been made public without any negative consequences. The website Black Box Voting has published not only GEMS databases from Alaska and California, but also other documents related to the GEMS Election Management System more generally. Bev Harris, *Elections Industry: Voting System Technical Material, Manuals, Troubleshooting*, Black Box

Voting.org (Jan. 8, 2014), <http://blackboxvoting.org/voting-system-technical-information/>. These include a GEMS user manual, a GEMS training guide, assignment lists for locations (*including Georgia*) using GEMS EMS, a manual for the communications protocol used to exchange data with a GEMS Server, and a “working full installation kit for Diebold GEMS system.” No known security issues have resulted from the public disclosure of GEMS databases from Alaska, California, or Arizona. Thomas A. Ryan served as a member of the Pima County Election Integrity Commission from 2008 to 2018. In his declaration, attached hereto as Exhibit D, Dr. Ryan states: “GEMS databases were available for public inspection in Pima County from 2008 until the system was replaced in 2016. During that time, I am aware of no problems arising from the availability of the databases.” (*Id.* ¶ 17).

The State’s handling of the GEMS Databases also is inconsistent with their current claim of confidentiality. Director of Elections Michael Barnes admitted in deposition testimony last week that at least one Georgia GEMS database was accessible and downloadable on CES’s webserver at KSU for months (and probably years) and that the Secretary did not secure CES’s webserver for months after being warned by Logan Lamb of the public accessibility to the databases and associated files.

State Defendants' confidentiality claim is further inconsistent with the extremely wide distribution of the databases. In his deposition, Mr. Barnes confirmed that GEMS databases are sent to all 159 counties and then copied by the counties onto memory cards that are then loaded into the State's 27,000 DRE machines. Lynn Ledford, Gwinnett County Director of Elections and Registration, testified that counties share DRE machines with municipalities requiring DREs to conduct their own municipal elections. The internal memory of these DREs contains GEMS database information from prior elections when the machines are transferred to the municipalities. The municipalities are not subject to nondisclosure agreements for this GEMS database data. *See* Deposition of Lynn Ledford, attached as Exhibit E, at 173:15-177:22.

Jennifer Doran, Morgan County Election Supervisor testified in her deposition that Morgan County engages an independent contractor to support the administration of their elections. This contractor has access to the counties' GEMS Databases without restrictions on disclosure.⁶

Plaintiffs understand that it is frequently more convenient for parties to concede to confidential treatment of documents in discovery even when there is no

⁶ The transcript of Ms. Doran's June 29, 2019 deposition will be filed with the Court when it is available.

colorable claim to confidentiality, simply to avoid the burden and expense of disputes such as this. However, to concede to a confidentiality designation for this manifestly public information would be inconsistent with the standards this Court has articulated for such treatment and with the fundamental principles of government transparency and accountability through open meetings and open records. Plaintiffs will, of course, comply fully and carefully with any Protective Order entered by this Court, but do not believe that the State Defendants have come close to carrying their burden of establishing that the GEMS databases are confidential.

II. REVIEW OF REPORTS GENERATED BY GEMS DATABASES IS INSUFFICIENT

State Defendants offer to produce certain, limited reports generated by GEMS databases as a substitute for the production of the GEMS databases themselves. A closer review of what the GEMS databases contain, however, confirms that review of reports generated by the GEMS database will not provide meaningful discovery because they will likely not disclose errors or other flaws or vulnerabilities in the configuration of the GEMS databases.

The GEMS databases are worksheets built in Microsoft Access, a commonly available commercial software program used for worksheets and databases. (M. Bernhard Decl., attached as Exhibit C, at ¶ 13). In his recent deposition, Michael

Barnes confirmed that the GEMS databases are built in the Secretary of State's office for each election in each county and then transmitted to each county prior to the election. After the election, each county transmits the GEMS database back to the Secretary of State with completed vote information.

To show how GEMS databases are built, Plaintiffs have attached as Exhibit F selections from the GEMS users manual.⁷ To build a GEMS Database for a particular election, the Secretary of State's staff will load tables of information into the database for the particular race, and then make a number of choices about the relationships between the various tables of information. Several of the steps would involve naming the election (in the User Guide it is "Beaufort County General Election") (page 2-4), selecting a date (page 3-4), and selecting the "voter group." A non-partisan election ("N.P."), for example, should be coded with the identification number "0." A Green party primary should be coded with the voter group number 5, which number (if the database is configured correctly) should

⁷ In his recent deposition, Mr. Barnes testified that the generic 2005 Users' Guide attached as Exhibit D appears similar to the Users Guide used by Georgia today. While GEMS Databases in Georgia may have some Georgia-specific fields or data, the *structure* is identical to every other GEMS Database from every other jurisdiction. Defendants have provided no evidence to the contrary. (The transcript of Mr. Barnes' deposition will be provided to the Court as soon as it is available).

correspond to Green party voters. Other sections of the User Guide shows how to assign numbers for the various candidates in each election.

An examination of a GEMS database itself may, for example, reveal quickly that the database was misconfigured to record votes cast for Candidate A as votes cast for Candidate B, or that votes cast for Lieutenant Governor were actually being recorded as votes for State Senate District 47 candidates, or that some ballot styles displayed on the touchscreen failed to include a given contest. No standard report produced or display of archived files will detect the source or cause of the errors, and the reports themselves may be corrupted. Diebold voting system experts know that the GEMS Database “fails to conform to fundamental database design principles and software industry standards for ensuring accurate data. Thus, in election tabulations, aspects of the GEMS design can lead to, or fail to protect against, erroneous reporting of election results.” Thomas P. Ryan and Candice Hoke, *GEMS Tabulation Database Design Issues in Relation to Voting Systems Certification Standards*, 2007 Usenix/Accurate Electronic Voting Technology Workshop, at 1.⁸

⁸https://www.usenix.org/legacy/events/evt07/tech/full_papers/ryan/ryan.pdf.

GEMS database analysis and comparisons to polling place paper records could also reveal signs of interference. Standard reports from the GEMS databases will not inform an examiner of a programming, configuration, or operational error, and would not reveal malicious hacking or other interference. If someone had gained access to a GEMS database and intentionally misconfigured it—without malware or some sort of hacking—the reports might read as completely normal because the database is producing what it was configured to produce. “The Diebold/GEMS system is particularly vulnerable to malicious data manipulation because the election database can be edited with the aid of commonly available software. Editing the database in this way leaves no traces in the election system activity logs.” Ryan Decl. at ¶ 13. “Detection of data manipulation would require analysis of the election database to look for inconsistencies. Standard reports generated by the GEMS system would rarely detect such manipulation or configuration errors.” *Id.* at ¶ 14.

Coalition Plaintiffs’ expert Matthew Bernhard explains that the only way to determine the impact of potential programming defects upon the number of votes is to review the original files used in the election—in this instance, the GEMS databases. (Bernhard Decl. ¶ 15, attached a Exhibit C). No standard report produced by the Diebold system would likely expose such programming errors, in

particular because the programming that generates such reports may itself be faulty.⁹ Malware and other forms of intentional interference may affect the production of the reports as well, in order to cover its tracks. Moreover, the reports are just PDF printouts that can be hundreds of pages long for each county for each election. They are not amenable to proper data analysis or even review; it would be logistically infeasible for Plaintiffs to rebuild the data in these reports into a useful data set. The ballot image reports from just the November 8, 2018 election would comprise nearly 4 million pages, making analysis impossible with mere PDF reports. The GEMS databases themselves are needed for meaningful security and integrity analyses.

III. PRODUCTION OF GEMS DATABASES IS DISTINCT FROM AND SHOULD PRECEDE PRODUCTION OF GEMS SERVERS

For a host of practical reasons, the production of the GEMS databases should precede the production of the more complex and sensitive GEMS servers. Review of the GEMS databases—while incomplete—is the most expedient means of beginning to identify errors or other flaws or vulnerabilities in the GEMS

⁹ These reports include the “Base Precincts With Races Report,” the “Vote Center with Cards Report,” the “Statement of Votes Cast Report,” the “Summary Report,” and the ballot image reports.

system and does not implicate the security concerns presented by review of the GEMS servers.

Specifically, Plaintiffs seek review of the GEMS databases to answer questions related to specific anomalies and apparent errors detected in reviews of public records of recent elections, especially the November 6, 2018, election.

These questions include such issues as:

- Did errors in a GEMS database configuration cause some voters' ballots to exclude the Lt. Governor's race?
- Did database configuration defects create an exaggerated level of undervote in the Lt. Governor's race in some precincts in African American communities?
- Are anomalous results on election night poll tapes also reflected in the vote tally databases? Are there patterns that point to the underlying cause for the anomalous results?
- Are vote tallies accurately tabulated?
- Are there configuration defects that caused the unexpectedly high participation rates in isolated low profile down ballot races?
- Did configuration defects switch the vote tallies between candidates?

- Were there memory cards containing votes reported on poll tapes that failed to be loaded into a GEMS database?
- When poll tapes have discrepant ballot cast quantities, which number of ballots was counted?
- For poll tapes dated well before or after the election, what vote tallies were included in the GEMS Databases for the official count?
- What vote data was uploaded from DRE memory cards that poll tapes indicate appear to contain corrupted time, date, and election information?
- Why do races for Congressional Districts 6, 11, and 13 appear on the poll tapes at Grady High School precinct, which is in Congressional District 5? Are the DREs generating defects or was there a misconfiguration in the GEMS Databases?
- Why do some DRE ballots appear to show no votes cast? Is this a configuration error or other potential defect to be analyzed?
- During Fulton County's upload of the April 18, 2017, Special Congressional District 6 election, what GEMS database loading errors were recorded? Do all memory cards appear to be loaded? Are there anomalous appearing results in the database from cards that were improperly uploaded on election night?

- When polling place recap sheets show a different number of voters voting than the DRE machines report as total ballots cast, what number of ballots was recorded in the GEMS Database for vote counting?

Subjecting the GEMS databases to the security measures that forensic images of the GEMS servers may warrant would greatly prejudice Plaintiffs and their ability to prosecute their claims in this case. The labor-intensive work in reviewing the GEMS databases for answers to these and other important questions regarding the security and integrity of the GEMS system does not require cyber-security or computer science expertise, and is better undertaken by data analysts, elections systems experts, and counsel familiar with how the elections should be conducted and ballots configured. Plaintiffs expect the analysis to require hundreds of person hours of analytical and clerical work that is not appropriate or economically feasible for a computer security or voting system computer science expert.¹⁰ The cost alone to Plaintiffs would be enormous. But neither do such experts have the time for such a substantial undertaking. Voting system experts, such as Alex Halderman and Matthew Bernhard, will assist in the technical aspects of forensic reviews, but they cannot alone perform the clerical analysis of data in a

¹⁰ For the Coalition Plaintiffs, Coalition Plaintiff William Digges III, who also has substantial database experience, will lead this review.

database, or testing tallies, or the comparison back to hundreds of paper records.

Nor is it appropriate to expect them to do such clerical work.

Analysis of the data and configurations found in the GEMS databases by Plaintiffs may pinpoint configuration mistakes or evidence of more fundamental systemic flaws or vulnerabilities in the databases or election system, flaws that will need further forensic analysis of the databases or the GEMS servers themselves.

For the foregoing reasons, the Court should order the Secretary to produce the GEMS databases immediately without any confidentiality restriction.

Respectfully submitted this 1st day of July, 2019.

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CERTIFICATE OF COMPLIANCE

Pursuant to LR 7.1(D), I hereby certify that the foregoing document has been prepared in accordance with the font type and margin requirements of LR 5.1, using font type of Times New Roman and a point size of 14.

/s/ *Bruce P. Brown*

Bruce P. Brown

CERTIFICATE OF SERVICE

This is to certify that I have this day caused the foregoing to be served upon all other parties in this action by via electronic delivery using the PACER-ECF system.

This 1st day of July, 2019.

/s/ Bruce P. Brown
Bruce P. Brown

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IN THE UNITED STATES DISTRICT COURT
FOR THE NORTHERN DISTRICT OF GEORGIA
ATLANTA DIVISION

DONNA CURLING, ET AL.,	:	
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PLAINTIFFS,	:	
vs.	:	DOCKET NUMBER
	:	1:17-CV-2989-AT
BRAD RAFFENSPERGER, ET AL.,	:	
	:	
DEFENDANTS.	:	

TRANSCRIPT OF TELEPHONE CONFERENCE PROCEEDINGS

BEFORE THE HONORABLE AMY TOTENBERG

UNITED STATES DISTRICT JUDGE

JUNE 28, 2019

2:06 P.M.

MECHANICAL STENOGRAPHY OF PROCEEDINGS AND COMPUTER-AIDED

TRANSCRIPT PRODUCED BY:

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UNITED STATES DISTRICT COURT
OFFICIAL CERTIFIED TRANSCRIPT

A P P E A R A N C E S O F C O U N S E L

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P R O C E E D I N G S

(Atlanta, Fulton County, Georgia; June 28, 2019.)

COURTROOM DEPUTY CLERK: Good afternoon, everyone. We're here for the teleconference in the case of Curling, et al. vs. Raffensperger, et al., Civil Action Number 17-CV-2989.

Beginning with the Curling plaintiffs, would counsel please introduce yourselves for the record.

(Unintelligible.)

MR. SPARKS: This is Adams Sparks with Krevolin & Horst also for the Curling plaintiffs.

COURTROOM DEPUTY CLERK: Okay. We are not able to hear. Are we on cell phones?

MS. CHAPPLE: We are not -- we are on -- is that a little better? I'm leaning over the phone.

COURTROOM DEPUTY CLERK: That's actually a whole lot better. If you would please make your appearance again.

MS. CHAPPLE: This is Catherine Chapple with Morrison Foerster. David Cross is also on the line from Morrison Foerster. I have with me in the room Dr. Alex Halderman. And on the line is also Adams Sparks with Krevolin & Horst. We're all on the line for --

MR. KNAPP: Halsey Knapp is here as well.

THE COURT: So Halsey was clear. When Catherine was speaking -- this is Judge Totenberg -- it was a -- excuse me for using your first name. But it is the easiest at the moment

1 on a Friday afternoon. It was -- there was a whole side
2 buzzing.

3 MS. CHAPPLE: Was there? Okay. I'm sorry, Your
4 Honor. I will try to call back in using another -- another
5 phone.

6 THE COURT: Okay. Thank you.

7 MS. CHAPPLE: Okay. Just one second.

8 **(There was a brief pause in the proceedings.)**

9 COURTROOM DEPUTY CLERK: I'm sorry. Who is speaking?
10 Hello?

11 MS. BURWELL: Hello. This is Cheryl Ringer and Kaye
12 Burwell from Fulton County. All of a sudden, our phone kind of
13 went silent.

14 COURTROOM DEPUTY CLERK: No, ma'am. We were just
15 waiting on Ms. Chapple to come back on.

16 MS. BURWELL: Thank you.

17 COURTROOM DEPUTY CLERK: Who do we have on the line
18 for the Coalition?

19 MR. BROWN: Hello. This is Bruce Brown. And also on
20 the line is Matt Bernhard, our expert, and my client, Marilyn
21 Marks.

22 COURTROOM DEPUTY CLERK: Okay. Thank you, Mr. Brown.
23 State of Georgia?

24 MR. RUSSO: This is Vincent Russo. I have here with
25 me Josh Belinfante. We also have on the line Bryan Tyson,

1 Bryan Jacoutot, and Carey Miller. And we also have in here
2 with us from the Secretary of State's office Merritt Beaver,
3 the CIO of the Secretary of State's office, and Kevin Rayburn.

4 COURTROOM DEPUTY CLERK: Okay. Thank you, Mr. Russo.

5 And we have Ms. Ringer and Ms. Burwell on for Fulton
6 County.

7 MS. BURWELL: Yes.

8 MS. CHAPPLE: Hello, this is Catherine Chapple and
9 Dr. Halderman. We just called in from my office.

10 COURTROOM DEPUTY CLERK: Sounds much better. Thank
11 you, ma'am.

12 MS. CHAPPLE: Perfect. Thank you very much.

13 MR. CROSS: This is David Cross. I'm on for the
14 Curling plaintiffs as well.

15 THE COURT: All right. This is Judge Totenberg.
16 Good afternoon. I'm going to deal with the issue -- the
17 substantive issues before you get to the protective order.
18 Though I understand that there is a strong connection between
19 the two. And arguably some of the issues might be resolved if
20 you had resolved the protective order issue.

21 But let me at least get a sense of the issues at play
22 with the -- on the merits of the request for production. I
23 don't -- let me just ask the first question. Why is it that
24 the plaintiffs need the entire state GEMS database?

25 MR. BROWN: Your Honor, this is Bruce Brown for the

1 Coalition plaintiffs. The GEMS database is an application
2 system that the Secretary of State sends to each of the
3 counties after building the ballots at the Secretary of State's
4 office. And it is the GEMS database that contains fields and
5 tables. And it is the mechanism by which the GEMS system
6 accesses the information from a voter when a voter votes.

7 So the GEMS database -- it is by no means the entire
8 state system. It is just one piece of it. It is the low
9 hanging fruit in a way in that it gives a good overview of the
10 application, and it is very easy to produce -- physically easy
11 to produce. It is simply a CD for each county.

12 And our experts understand that it is the best first
13 thing to review when trying to look for defective programming.
14 And the GEMS database is a -- there is no source code. There
15 is no proprietary IP involved. It is a public record in other
16 states, though not in Georgia. Examples of GEMS databases are
17 on the internet. And a GEMS database for the State of Georgia
18 was one of the files that Logan Lamb had access to when he had
19 access to the web server at KSU in 2016.

20 And so it seems to be a good place to start on the
21 discovery. We sent this discovery out in March actually even
22 before the discovery period began. And one of the reasons why
23 we sent it out was to get a start on lining up the forensic
24 work that would be necessary. There's many steps that follow.
25 But this was a good first step.

1 MS. CHAPPLE: Your Honor --

2 THE COURT: Just one second.

3 Mr. Brown, let me ask you an additional just
4 follow-up question, which was: Why would you need it for the
5 entire state as opposed to the CDs of the database for a
6 selective -- a representative number of cities and counties
7 associated also with those that are having elections?

8 MR. BROWN: I will give -- I will give you one
9 advantage. We have seen aberrant vote totals in many
10 counties --

11 THE COURT: You had seen -- I'm sorry. You had seen
12 what?

13 MR. BROWN: Aberrant vote totals that appear in some
14 counties that do not appear in others. And so one of the ways
15 of trying to detect a defect in the programming, innocent or
16 not, would be to compare the database that was sent to County
17 A, for example, with the database that was sent to County B.

18 And it is also -- on just the burdensome issue, Your
19 Honor, we're just talking about CDs. It is not -- it is not a
20 very taxing production effort to produce the databases for the
21 different counties. It is just (unintelligible) or any sort of
22 forensic type of work involved in the production.

23 THE COURT: Keep close to the mic on your phone
24 because you're coming in and out. I understand you. But the
25 court reporter cannot get it with enough consistency to be able

1 to --

2 MR. BROWN: Thank you, Judge. I apologize. We're in
3 Athens. We just took a deposition in this case, and so I'm
4 speaking on a cell phone. I apologize.

5 THE COURT: Okay. Well, Ms. Chapple, was that you
6 trying to speak?

7 MS. CHAPPLE: Yes, Your Honor. Thank you. This is
8 Catherine Chapple. I wanted to add two things to what
9 Mr. Brown was saying.

10 First is that the GEMS system is the ideal -- is an
11 ideal infection point. And so it is also a place that we would
12 like to look for malware on the machine -- within the system.

13 And then, second, that the Curling plaintiffs would
14 like more than just the CDs that Mr. Brown is referencing. We
15 would like -- I'm actually looking at Dr. Halderman because I
16 think he is in a better position to explain exactly what we are
17 looking for if -- but -- and then he typed out a hard disc
18 image of the server is what the Curling plaintiffs would like.

19 THE COURT: And is that what you have actually
20 requested as well? I know you would like it, but has that been
21 the subject of an actual request?

22 MS. CHAPPLE: I believe so, Your Honor. But I would
23 need to look for the number of the request.

24 THE COURT: All right. So just to save time --

25 MR. CROSS: Your Honor, this is David Cross.

1 THE COURT: Yes.

2 MR. CROSS: I can help. It is Request Number 15. It
3 is the one that we referenced in the notice that we sent in to
4 join the call. It seeks all the underlying data on the GEMS
5 server and in other respects. So the GEMS server is the only
6 focus today. And we received an amended response from the
7 state defendant this morning. The request indicating that they
8 are not going to produce the GEMS database itself or any of the
9 underlying data or image is how I read their response.

10 THE COURT: All right. So does Dr. Halderman wish to
11 explain the need for this from your perspective or his
12 perspective?

13 DR. HALDERMAN: Yes, Your Honor. So the GEMS
14 database or the GEMS server -- excuse me -- is essentially the
15 nexus of the whole election system. This is a place from which
16 ballot programming is being produced and distributed down
17 through the counties to the voting machines throughout the
18 state.

19 So that positioning makes it an ideal point for an
20 attacker to begin an infection that they would try to spread to
21 voting machines in the field. We would like to be able to
22 perform forensics on the GEMS server to see if there is
23 evidence that such an infection did occur.

24 THE COURT: All right. So the state indicates it has
25 made other alternative suggestions in place of these requests.

1 I don't know what those are. But I'm trying to, first of all,
2 just determine: Did you actually sit down and discuss any of
3 those? Did you have any of your experts talk with the chief
4 technology officer for the Secretary of State's office, Merritt
5 Beaver, or what did you do?

6 MR. BROWN: Your Honor, this is Bruce Brown. We did
7 discuss the options. And the options -- there were a couple of
8 things discussed with the state. The first was we made
9 repeated requests to the state to identify the fields and the
10 tables in the database that they contended contain sensitive
11 information but they did not want to disclose.

12 And the state refused to identify the fields taking
13 the position it said that it was the entire architecture of the
14 database that was proprietary. The next thing that we
15 discussed was their offer to produce certain printed reports
16 that would be generated by the GEMS database pursuant to the
17 GEMS database report function. Just like most applications, in
18 addition to all the computing functionality they have, they
19 also have a piece that will let you select data and report it
20 anyway you want to.

21 Our experts are on record as saying that that
22 production of reports generated by the GEMS database may be
23 interesting and it may also be subject to discovery but it is
24 many orders of magnitude removed from any kind of effort to
25 determine if there's defective underlying programming. You

1 would have to take a PDF of a report.

2 So those were the two areas that we discussed. And,
3 frankly, I think it is fair to both sides -- to both sides that
4 we are at a pretty fundamental disagreement over the discovery
5 of the GEMS database. We have advanced it to a point where it
6 is appropriate to seek Your Honor's guidance.

7 THE COURT: Well, does anyone on the plaintiffs' side
8 want to explain why their offer of the report would -- while
9 not the full monty would be still not -- and I understand it is
10 not. But why wouldn't it be sufficient from your perspective?
11 Is that Dr. Halderman who is going to be --

12 DR. HALDERMAN: Yes, Your Honor. I can explain.
13 What a report from GEMS covers is -- it is essentially a
14 summary of some of the kinds of data in the system. But it
15 does not tell us about the -- about the underlying programming
16 essentially that is going to be affecting the way -- the way
17 votes are counted. Nor does it tell us about potential
18 corruption to the database itself that could be used as a means
19 of infecting or altering the behavior of the system.

20 I would also like to add that our request for the
21 hard disc image for this server I had said was to allow us to
22 identify whether infection had occurred. I should have added
23 that it will also allow us to evaluate vulnerabilities in the
24 system that could provide a way to infect the system and
25 manipulate elections using the GEMS server as an infection

1 point.

2 THE COURT: I understand some of this. But the
3 plaintiffs provided me with a copy of the 2007 decision from
4 Arizona -- from an administrative judge in Arizona. And, of
5 course, that was pursuant to an Open Records Act request. But
6 in that case, which was -- I'm sorry. It was in front of the
7 superior court judge. But it was *Democratic Party of Pima*
8 *County vs. Pima County Board of Supervisors*. And I guess there
9 was an administrative judge involved also who was writing the
10 initial decision.

11 The judge found that the database should be made
12 available but not the programming because of the concerns about
13 security and security of the election-related functions. And
14 so it seems like the Coalition is willing to forgo having --
15 obtaining that, the programming information, and just wants the
16 database and the Curling plaintiffs want both.

17 Is that a correct summary?

18 MR. BROWN: Your Honor, that's a correct summary as
19 of this moment. This is Bruce Brown for the Coalition. I'm
20 sorry. But this was our first very limited narrow request, and
21 we would eventually also seek the disc image of the servers --
22 there is more than one -- and pursue what Dr. Halderman
23 suggested.

24 So we teed up the dispute resolution process over
25 this very narrow limited request that we made first. And

1 Curling came in with a broader -- broader request. So we have
2 technically joined their request as well. But in terms of the
3 dispute resolution process, we are here before you on the GEMS
4 database. And so that is what our request today concerns.

5 MS. CHAPPLE: Your Honor, this is Catherine Chapple
6 for the Curling plaintiffs. Yes. Yes, that is what we're
7 asking for. And we feel that a protective order should be
8 sufficient to protect and allay the concerns of the defendants.

9 We also asked them when we met a couple of weeks ago
10 at the Rule 26(f) conference to identify what issues would be
11 inherent in our request, what they were willing to give us and
12 what they could not give us. And we still have that offer
13 open. But we have not heard from them as to specifics that
14 would allow us to tailor our request any further.

15 THE COURT: Well, the way I understood it from the
16 state's statement of its position was they felt that you were
17 not interested, you weren't going to consider any alternatives,
18 which might be so. I don't know. But you saw that as well?

19 MS. CHAPPLE: Yes, Your Honor. Our position was that
20 we don't have the access to the information about the system to
21 know what is involved and what they could give us that they
22 might be comfortable with that would be sufficient for us to be
23 able to respond without more information from them.

24 So it is not -- it is not that we aren't interested.
25 It is that we don't have enough information to know whether we

1 would have an interest.

2 THE COURT: Well, what have you-all done to have
3 Dr. Halderman talk with Mr. Beaver or somebody else designated
4 by the state so that you could explore that very question?

5 MS. CHAPPLE: Your Honor, that is a good suggestion,
6 and we would be open to a conversation like that.

7 MR. CROSS: Your Honor, this is Davis Cross. I guess
8 the one thing that I would offer is we don't have a lot of
9 time.

10 THE COURT: No. I know that.

11 MR. CROSS: We want to be efficient. My concern is
12 what we have heard from them so far and what they have offered
13 up in terms of these reports, which we have talked through with
14 Dr. Halderman, obviously are inadequate. If there is a way to
15 work this out to where we get the data and we get it quickly,
16 certainly we're willing to explore that.

17 But we have not heard anything from them that would
18 suggest that they are looking to give us anything other than
19 what sounds like are just one-off reports or snapshots of data
20 as Dr. Halderman explained won't do the job.

21 As Bruce pointed out, there are two things in the
22 database itself. There is the forensic image. If we can get
23 the database, that is a start. But I will add the reason why
24 we put them together is because, as Dr. Halderman has explained
25 to me, there is not a substantive difference. But if they give

1 us the database, there is nothing else sitting on there that a
2 forensic image has any greater sensitivity to.

3 So our view is let's just do it in the most efficient
4 way, which is take a forensic image of the server -- multiple
5 servers as it may be. We get the substantive data. But we
6 also get the additional forensic -- the whole comprehensive
7 image that allows the expert to do the forensic analysis, which
8 is really at the core of this case, rather than doing it
9 piecemeal.

10 Because at the end of the day, again, the forensic
11 image is going to contain the same substantive data as the
12 database itself. But we'll take it in whatever steps we can
13 get it.

14 I just haven't heard anything in the number of
15 conversations we've had with Mr. Russo's team that they are
16 willing to give us anything remotely close to what our experts
17 need. So I'm just not convinced that further conversations are
18 going to get us there. But we'll explore that obviously if the
19 Court wants.

20 THE COURT: Who is going to speak on behalf of the
21 state?

22 MR. TYSON: I will, Your Honor. This is Bryan Tyson.
23 We have had some conversations. I think it is important to
24 note that we have not had a situation where Dr. Halderman has
25 been able to speak to Mr. Beaver -- something we suggested --

1 about how to accomplish this.

2 I think the plaintiff has correctly identified that
3 this is the nexus to the election system. It is the most
4 critical infrastructure we have in terms of our election
5 system, which is why we are so careful with releasing it and
6 don't want to release it to someone who could -- or I think the
7 reality is when you take the database itself -- I'll start with
8 that and then go to the rest of the server.

9 If someone had the database, they could see the
10 relationships between the various data inside the database.
11 And if someone was trying to design malware, they would need
12 that information to do that. Georgia has a slightly different
13 version of a GEMS database than other states. And as a result,
14 an attacker without the knowledge of the structure of the
15 database can't -- is going to have a harder time designing
16 something.

17 In addition, there are other non- -- other
18 confidential information like the particular numbers assigned
19 to candidates. And if you're going to try to manipulate votes,
20 you have got to know the candidate numbers and the placements
21 to be able to do that. That would also be revealed in the
22 database.

23 So from our perspective, the plaintiffs' desire to
24 look for malware can be addressed through several other means
25 that we have been working towards. The first obviously was the

1 reports. So look for anomalies there. We understand the
2 plaintiffs don't like that option. We have a software called
3 GEMS Verify that checks the executable files of the GEMS server
4 against a trusted version of the GEMS -- of the GEMS executable
5 files that we can run on the database and ensure that the
6 executable files have not been altered in any way and share
7 those results with the plaintiff.

8 We also have from our understanding from our computer
9 science folks and others an Access database, which is what the
10 database is that the plaintiffs are seeking. The only malware
11 that could reside in the Access database -- so, you know, the
12 executables of the server files are one thing. Check those
13 with GEMS Verify.

14 The database can only have malware through a macro
15 inside the database. And we would be more than happy to
16 provide the plaintiff with all of the macros if we find any
17 that are currently in the GEMS database.

18 We think that addresses their concerns. It lets them
19 look at the -- see that server files have not been altered and
20 also see that the database does not have macros in it without
21 having to reveal the structure and the relationship of the
22 database and all that is inside there.

23 THE COURT: Well, I guess --

24 MR. BROWN: Your Honor, if I may, this is Bruce
25 Brown.

1 THE COURT: Let me just stop y'all for a second. I
2 have a general idea of what you are speaking about. But it
3 obviously would have been better if Mr. Halderman --
4 Dr. Halderman had -- and Mr. Beaver or his representative had
5 spoken before this conversation so that we're not just playing
6 it out in kind of rigid lawyer form now rather than their
7 having really talked and seeing if there is anything else.

8 I understand that what the plaintiffs want is what
9 they think is ultimately necessary. And I'm not dismissing
10 that. But at the same time, there is some concern about
11 proportionality that I have particularly in that we're going --
12 the state is moving to a different data system.

13 I realize that it all may fall apart. But,
14 nevertheless, that is not the expectation, and I can't operate
15 on that expectation. So I'm looking at the amount -- the
16 number of elections we have, the nature of the elections. And
17 I'm saying I have some proportionality concerns and what -- are
18 there any work-arounds at all at this juncture, even though the
19 ideal might be from Dr. Halderman's perspective and the
20 plaintiffs' perspective something else?

21 Is there anyway I could persuade you-all to put the
22 two of them on the phone for 15 or 20 minutes to talk? And we
23 would -- I mean, I'm not saying that you-all can't be present.
24 But that they are actually talking. I mean, I would have hoped
25 that that would have happened. But it hasn't happened.

1 Is that -- is that feasible?

2 MR. TYSON: For the state, Your Honor, we would be
3 more than happy to make Mr. Beaver available.

4 MR. CROSS: I thought Mr. Beaver was with you guys.
5 Can we do that now?

6 MR. TYSON: Yeah. And we're fine to have the
7 discussion now or with Dr. Halderman directly. We're very open
8 to that.

9 MR. BROWN: We are -- Your Honor, this is Bruce
10 Brown. Our expert would like to participate as well.

11 THE COURT: Yes. I'm sorry. I missed what the name
12 of your expert was.

13 MR. BROWN: It is Matt Bernhard.

14 THE COURT: Right. I remember the affidavit now.

15 All right. Well, why don't I get off the phone and
16 you-all -- I can go even on mute if you want to. But that is
17 an extra -- which is -- which is fine. But you could also
18 arrange it differently and call each other. But I don't know
19 who has a line there, and then you-all have to get connected
20 again.

21 But why don't I just go on mute. Then when you are
22 ready to -- you can -- you can always then have them talk
23 separately or whatever you want to do. You can make the
24 arrangements. And then when you are ready to actually talk,
25 you can email Mr. Martin as soon as you are ready to talk and

1 he will be looking every few minutes at the -- at his email to
2 see that you are ready.

3 MS. CHAPPLE: Thank you, Your Honor.

4 THE COURT: All right. Very good. Thanks. All
5 right. I'm going on mute now. But you are still connected.

6 **(A brief break was taken at 2:38 P.M.)**

7 THE COURT: Hello. This is Judge Totenberg again.

8 MR. CROSS: Hi, Judge.

9 MS. CHAPPLE: Hi, Judge.

10 THE COURT: So did you make any progress?

11 MR. CROSS: I'm not sure we made much progress, Your
12 Honor. We had a lot of discussion. Where we ended up was
13 Mr. Brown on behalf of plaintiffs proposed a compromise in
14 limiting the data down to 25 of 159 counties. We would choose
15 those counties. So it would be a much smaller sample, which I
16 think was one of the things Your Honor had suggested.

17 We also agreed that we would adhere to similar
18 security protocols that the state has in place for each of the
19 159 counties, which also have a copy of this system and run
20 that system to address their security concerns. And we offered
21 any other security protocols that they would offer.

22 The end result was they would not offer, as I
23 understood it, anything more than they had originally offered.
24 Although they proposed something additional concerning macros.

25 But where we seem to be divided on really is the

1 issue of security. Their position seems to be that they won't
2 produce the GEMS database, either the database itself for a
3 forensic image or what are called MGB files under any
4 circumstances because it sounds like they just don't trust our
5 experts to keep that secure, even though we have offered again
6 to abide by the same or similar protocols as the 159 counties.

7 I'm not sure where we get at the end of the day. The
8 other challenge was Dr. Halderman asked Mr. Beaver whether --
9 if he wanted to conduct the same sort of analysis that we are
10 trying to do that our experts have described to look for
11 malware in the system, to identify vulnerabilities with respect
12 to the system, is there an alternative approach, is there
13 something less that he would look at beyond what we have
14 requested. And Mr. Russo would not allow him to answer that
15 question.

16 So we seem to be at an impasse. I wish I had a
17 better answer.

18 THE COURT: Let me just -- go ahead. Who is that?

19 MR. TYSON: On behalf of the state, Your Honor, I
20 just wanted to give a little bit different view. I'm not
21 surprised we disagree on this. But the scenario really comes
22 down to Dr. Halderman and the plaintiffs, even if they are
23 narrowing the number of counties, they are still insisting on
24 the actual raw Access database file. And those are the ones
25 that show the structure and reveal the structure on everything.

1 So that doesn't meet our main concern.

2 The other challenge where the databases are located
3 in other places, the counties don't have the same kinds of
4 tools that they would be using and other things that are
5 happening.

6 And to Mr. Cross' characterization that Mr. Beaver
7 was refusing to answer or we wouldn't allow him to answer, the
8 questions were turning into a cross-examination and a
9 deposition of whether Mr. Beaver would concede certain points.
10 That is why we decided to come back to you to just go ahead and
11 address this. I want to be clear about where we were.

12 THE COURT: Okay. So --

13 MR. CROSS: Your Honor, the question was posed by
14 Dr. Halderman. If we could get an answer to that question on
15 this call, I think that would help us go a long way. It was
16 not a cross-examination.

17 THE COURT: Well, I guess the question --

18 MR. CROSS: It was a conversation between the
19 parties.

20 THE COURT: All right. I'll get to that in a second.

21 All right. I'll just myself ask if there is any
22 alternatives. But I guess just -- I wanted to ask about the
23 database itself. I'm not clear why as the database itself the
24 defendant is not willing to provide that on a CD as Mr. Russo,
25 I believe, you conceded to Adele Grubbs in the Superior Court

1 of Cobb County, I guess it is, that the database itself was
2 public record. It was the programming that was not -- that you
3 maintained.

4 MR. RUSSO: Your Honor, I mean -- this is Vincent
5 Russo. Our concern with the database has always been that it
6 is a roadmap to being able to -- for anybody who wants to
7 conduct -- try to put any malicious -- for putting malware on
8 the system, the database is the roadmap. And I think the
9 plaintiffs have said so much.

10 What we have offered is the macros. That, you know,
11 if there was -- if there was some -- there was some malware in
12 that -- might have been in that database, it is our
13 understanding that is where it would exist. In addition to on
14 the servers, which are the additional reports that we offered
15 to run, it is a test. It is called the GEMS Verify test that
16 would check the servers to see if there were any files that had
17 been changed.

18 So those two together provide them with the
19 information that is proportional and without necessarily
20 providing the roadmap that someone would need to write -- write
21 malicious -- you know, malicious software.

22 MR. CROSS: Your Honor, David Cross, if I may.

23 **(Unintelligible crosstalk.)**

24 THE COURT: One person. I know you can't all see
25 each other. But wait until Mr. Russo is really complete.

1 MR. RUSSO: So it sounds like my co-counsel, Bryan
2 Tyson, was going to add something to that.

3 THE COURT: Okay.

4 MR. TYSON: Yes, Your Honor. I'm sorry. Just very
5 briefly. Bryan Tyson. I just wanted to also make the point
6 that in front of Judge Grubbs the plaintiffs made the same
7 argument that they are making here. And Judge Grubbs -- the
8 state took a consistent position. Judge Grubbs did not allow
9 them to have the database files after a similar argument and
10 believed that the reports that were offered, which was our
11 first offer to the plaintiffs here, were sufficient.

12 I know the plaintiffs disagree about that. But it
13 was the same argument, and the state took the same position
14 that we can't give you the actual database.

15 THE COURT: All right.

16 MR. CROSS: Your Honor, this is David Cross, if I
17 may. Mr. Russo's argument really highlights and I would say
18 implicitly concedes the point, which is he says the database is
19 the roadmap if someone wanted to hack the system. Well, that
20 is our point, Your Honor.

21 The only way to evaluate the infection points as
22 Dr. Halderman describes them and to identify the
23 vulnerabilities is to see that roadmap, what a hacker would
24 would want to see. The hacker -- the way that they would
25 navigate that roadmap to get into the system.

1 What they are offering, as I understand it, is a
2 small subset of data. Dr. Halderman has explained in detail
3 why it is not sufficient. But one of the things that Mr. Russo
4 said, as I understand it, that might let us see if there is
5 existing malware in a small portion of the database. Again,
6 that doesn't get us where we need to go, which is assessing
7 whether there is malware in other portions of the database but
8 also to the broader point of what the vulnerabilities are
9 because the focus of our case is not just that there's already
10 malware there but that the vulnerabilities themselves are so
11 severe as to vitiate the right to vote in the State of Georgia.

12 And I would say Mr. Russo seems to be conceding the
13 point. Although he doesn't obviously intend to. The roadmap
14 is what we need to see.

15 The last point of this, Your Honor, on this issue of
16 security, which really seems to be their only objection here,
17 we have not heard anything from Mr. Beaver or from them that
18 the analysis that needs to get done here can be done on less
19 than what we have requested, which again has been narrowed
20 quite significantly.

21 The last point is Dr. Halderman deals with some of
22 the most sensitive data all the time. He is one of the leading
23 experts in this field. He deals with cryptographic protocols
24 affecting tens of millions of websites. This is what he does.
25 They have specific facilities at the University of Michigan to

1 deal with highly sensitive data.

2 Mr. Bernhard actually is also at the University of
3 Michigan. So they would have access to similar facilities. I
4 will offer as a last resort -- Dr. Halderman may kick me for
5 saying this -- if we had to actually go to Georgia in some
6 facility they set up, it would be difficult. It is not ideal.
7 It would, I gather, hinder the analysis. But we could explore
8 that, if it is necessary.

9 But the bottom line is their objection is one of
10 confidentiality. And that is dealt with with the protective
11 order, and we're talking about experts that deal with equally
12 similar, if not more, sensitive data in the regular course of
13 their work.

14 THE COURT: Let me ask this. The GEMS database
15 itself -- I just want to confirm -- is going to still be the
16 foundation to draw on when you -- when the state moves on into
17 the next -- the ballot marking device system or not?

18 MR. RUSSO: That is correct, Your Honor. When the
19 state moves to the new system, they will not be using the GEMS
20 database.

21 THE COURT: All right. And what will be used -- it
22 will not be using it you are saying?

23 MR. RUSSO: That is correct.

24 THE COURT: All right. And how will the data be
25 transferred? I don't obviously mean all the nitty-gritty

1 details. But is there anticipated a transfer of all of the
2 voter data?

3 MR. RUSSO: I mean, I guess I can say we don't -- we
4 don't have a system yet. So I don't know which system they
5 will be using in lieu of the equivalent to a GEMS database.
6 But, you know, there will be -- there will be something. I'm
7 just not sure what it is. And they don't know either.

8 THE COURT: All right.

9 MR. RUSSO: Until they know the vendor, they won't
10 know what that will look like.

11 THE COURT: What again is the date by which the
12 vendor is going to be selected?

13 MR. TYSON: I believe that was supposed to be
14 mid-July. But I don't know what the current timeline is. I
15 think they are still on track on that. I'm not certain, Your
16 Honor.

17 MR. RUSSO: I was just confirming. They are still on
18 target for the original timeline.

19 THE COURT: Okay. So I think that the question
20 was -- and I don't see it just as a rhetorical question. But I
21 understand why counsel for the state prefers not to be -- have
22 their -- Mr. Beaver directly questioned. And I don't want to
23 be in that position of examining him either.

24 But if there is -- why -- I would like to understand
25 why -- given what you've projected, why do you think -- why

1 Mr. Beaver or the state believes that those are adequate
2 alternatives, knowing what the purpose is in this case? It is
3 not just -- of the analysis.

4 MR. RUSSO: Just so we understand your question,
5 you're asking why the macros and the GEMS Verify report are a
6 sufficient alternative versus the entire -- producing the
7 entire database?

8 THE COURT: Well, the database for 25 localities,
9 which I thought they had agreed on alternatively.

10 MR. TYSON: Yes, Your Honor. This is Bryan Tyson. I
11 think the important piece is we don't see a distinction between
12 25 and the entire database because our concern is not the
13 amount. Our concern is the structure. And if you produce even
14 one database, you are showing the structure. So on that point,
15 that is there.

16 I think for us the GEMS Verify looks at the
17 executable files that are in use on the server. The macro test
18 within Access will show any code that can run. And so it
19 covers that basis. I think the plaintiffs' view is that there
20 could be something lurking deep inside the database. But that
21 is our view in terms of the security risks that are associated
22 with it verifying that the executables have not changed,
23 verifying there is not anything else on the server that is
24 obviously there. And verifying that there is nothing
25 executable within the database covers the concerns about

1 malware.

2 I understand the plaintiffs disagree. But that is
3 our view of why that is a sufficient resolution short of
4 exposing the relationships and the structure in the database.

5 THE COURT: So, Mr. Brown and Mr. Cross and I guess
6 to your experts as well, while it is obviously not what you
7 think in full that you need -- and it is your burden of
8 proof -- why wouldn't this at least begin to be helpful at all
9 to you and your experts in proceeding so that at least it is a
10 major first step or first and second step?

11 MR. CROSS: Your Honor, I would suggest that
12 Dr. Halderman handle that, if you don't mind. I think he can
13 better articulate rather than hearing from the lawyers. And,
14 frankly, I would suggest it is probably better that both sides'
15 experts speak to you directly.

16 Dr. Halderman, do you want to take that?

17 DR. HALDERMAN: Yes. So the alternatives that are
18 being proposed about looking for macros or using this hash
19 verifier, they cover entirely different parts of the data than
20 what we are talking about. What we're talking about is looking
21 for -- looking for kinds of corruption or manipulation that
22 could spread malicious code, which just wouldn't be revealed if
23 they are there by these other tests in which I think are
24 entirely plausible means for malicious software to spread from
25 this nexus of the system to wide areas of Georgia.

1 And does that answer your question, Your Honor?

2 THE COURT: Well, sort of. But the original request
3 at least from the Coalition was just give us the -- basically
4 give us CDs of the voter -- of the GEMS database. And as I
5 understand the conversation is that the state's concern is that
6 would identify the structure and information that goes to the
7 sort of secure operation of the system and that you're hoping
8 that it will though you don't think it is necessary but not
9 sufficient from your perspective; is that right?

10 DR. HALDERMAN: That is right. But if I may say, I
11 think it can be argued that almost any information about the
12 operation of the system could potentially aid an attacker. And
13 that is why we're proposing to protect the data in the same way
14 that we would protect -- that the counties already protect the
15 data and even to take steps beyond that we routinely take to
16 protect arguably even more dangerous data, if released,
17 including that what we have taken in the past to protect actual
18 flaws in the software running on people's voting machines.

19 THE COURT: Well, why -- let me just segue for a
20 moment on to the conflict over that protective order. Why is
21 it that the plaintiffs' counsel cannot agree to the terms
22 proposed by the defendants?

23 I looked at it. And I understand that there is this
24 disagreement about somehow a printout of the -- of the
25 ballot -- the ballot results in some way on an individual

1 ballot basis. But there also seemed -- because that was
2 allegedly already a public record -- had been yielded -- had
3 been -- but I wasn't -- there seemed to be other concerns on
4 the part of the plaintiffs that I didn't -- I really couldn't
5 fully understand.

6 MR. BROWN: Your Honor, this is Bruce Brown for the
7 Coalition plaintiffs. And I think David -- the plaintiffs are
8 speaking with one voice on these issues. And I note that the
9 disagreement here is primarily with Fulton County. I believe
10 the Secretary of State and the plaintiffs are largely in
11 agreement on these terms. I could be mistaken.

12 But one -- one issue is whether the protective order
13 should have retroactive effect, meaning that it could cover
14 documents that have already been produced without a
15 confidentiality agreement and produced without a
16 confidentiality stamp.

17 THE COURT: And this is the one that we got a sample
18 of; is that right? Or are there others like that?

19 MR. BROWN: There are many others. There are --
20 there are scores of ballot image reports that we have that have
21 been produced as open records. And there's simply no way that
22 we can -- I can let my client agree to a court order that binds
23 us to keep confidential an unspecified universe of documents
24 that the state may later determine are confidential.

25 And, frankly, in my experience you really never do

1 that. A protective order covers documents that are produced in
2 discovery. It is a narrow set. It doesn't cover information
3 sort of out in the world.

4 THE COURT: And that has mostly been produced by
5 Fulton County?

6 MR. BROWN: No. Other counties -- today, we got a
7 whole trove of the same documents from Bartow County. They are
8 public. There is nothing secret about them, Your Honor. And
9 so the counties are producing them as they should.

10 THE COURT: All right. Is it only Fulton or the
11 state also that is asking for this provision?

12 MR. BROWN: I do not believe -- well, I'll let the
13 state speak for itself. But I don't think the state was
14 insisting on retroactive application of the protective order.

15 MR. RUSSO: Your Honor, this is Vincent Russo. Our
16 issue is we want to be able to -- if there is something
17 produced in this case by a county, we don't have the ability to
18 control the counties and what they are necessarily producing.
19 In fact, Bartow County produced something today, and we didn't
20 even know about it.

21 And so we want to be able to mark that confidential
22 when we do find out about it, if it actually needs to be
23 confidential. And by allowing us to mark it confidential and
24 if the plaintiffs then disagree, we can go through the dispute
25 resolution process set out in the protective order.

1 But to just deem something that has been -- that has
2 been produced now as deemed a public record and it is no
3 longer -- we can no longer try to maintain the confidentiality
4 over is our concern. And we think that the protective order
5 has a process in it that if the plaintiffs disagree over
6 confidentiality designation we can go through the dispute
7 process in the protective order.

8 MR. CROSS: Your Honor, I want to make --

9 **(Unintelligible crosstalk.)**

10 MR. BROWN: I want to make sure the issues are clear
11 because we are bleeding several issues together. The first
12 issue is whether or not the protective order ought to have
13 retroactive effect and to be able to cover a universe of
14 information regardless of when or even whether it was produced
15 by a party. And I think no protective order does that. And
16 that it ought to be explicit that this one does not. That is
17 the first issue.

18 The second issue is whether or not it is explicit on
19 the first page of the protective order that we have all agreed
20 to that if a third party wants to designate something as
21 confidential they may do something under the protective order.
22 They may do it.

23 What the state wants to be able to do is to sort of
24 reach across the table and intercept documents that other third
25 parties are quite willing to share with the public or with the

1 plaintiffs and to capture those sort of in mid-discovery and
2 stamp them confidential.

3 And I have never heard of that happening and don't
4 know mechanically how that could ever happen. So we would
5 strenuously object to that in that if somebody is releasing
6 something that the Secretary of State doesn't want them to that
7 is between the Secretary of State and whoever that third party
8 is. They don't get to sort of intercept discovery like that.
9 Then the third -- so those are the first two.

10 The third has to do with the attorney's eyes only
11 provision, which the Coalition plaintiffs don't want at all.
12 It is not appropriate for this kind of information. There
13 should be one singular confidential designation and that --

14 THE COURT: Well, let me just say I have never heard
15 of an attorney's eyes only that was not attorney's eyes only or
16 with their expert on the other side of it. I mean, you have --
17 with the greatest of respect to your clients, the fact is that
18 they are committed activists in this area. And they have a --
19 hats off to them for their activities and their concerns.

20 But they don't have the same obligations on them in
21 terms of confidential information that you might or somebody
22 who is a direct agent like an expert who works in a very secure
23 field.

24 MR. BROWN: Your Honor, let me explain sort of the
25 background of that provision. We took the draft protective

1 order from the protective order that was entered in the Common
2 Cause case. That was our template. And that had a similar
3 provision that had two Common Cause activists on it.

4 Like I said, we don't like the attorney's eyes only
5 designation at all but figured, well, if we can get our client
6 on there we didn't -- it wasn't as big a deal. So I'm just --
7 we're not going to fight over something that has no material
8 impact. But that is certainly the source of the -- that
9 agreement and the terms.

10 We would much prefer not having an attorney's eyes
11 only provision because an attorney's eyes only provision in my
12 experience relates to trade secrets when the disclosure to the
13 client itself causes damage. And confidentiality provisions
14 are designed for information which damage does not happen when
15 you disclose it to the other party. It happens when that party
16 discloses it to the world.

17 So it just sort of conceptually does not belong in a
18 case other than trade secrets where you have got competitors
19 suing each other. That is our background on the attorney's
20 eyes only provision.

21 THE COURT: Mr. Russo or Mr. Tyson, what is the
22 concern about disclosing information to the plaintiffs' experts
23 who work with secure data systems and secured data all the time
24 and are very well aware of their obligations in this area and
25 their own professional standing depends on maintaining those

1 obligations?

2 MR. RUSSO: Your Honor, this is Vincent Russo. I
3 don't think with respect to the attorney's eyes only provision
4 that we had a concern particularly with the experts. I'll
5 defer to Fulton County on some of this issue.

6 THE COURT: Well, let me just say -- let me just
7 finish the data system. I mean, if you were to show the
8 information to the -- the data system and the database that we
9 were talking about, one or -- both or one like -- let's just
10 start off with the GEMS database.

11 Is there -- what is the reason you would believe that
12 the plaintiffs' experts would expose you to hacking or would do
13 something that would compromise themselves the system or create
14 trouble?

15 MR. RUSSO: Yes, Your Honor. I think our concern, of
16 course, is that the information gets put on their server at the
17 University or wherever they are working and someone else --
18 grad students end up taking that information and using it or
19 leaves it exposed. And so then that information is out in the
20 public sphere, you know, especially when we get into the GEMS
21 database.

22 Yes. We have talked about this -- it is the roadmap.
23 And, you know, the whole point of keeping that information out
24 of the public realm is so that nobody has the roadmap so they
25 easily write or more easily write malware that could infect the

1 system.

2 DR. HALDERMAN: May I -- this is Dr. Halderman. May
3 I suggest respectfully that we could address those concerns, I
4 believe, by analyzing the data on an air-gapped system in an
5 independently secured room where others not related to the case
6 wouldn't have physical access to it and where it would be
7 electronically safeguarded against any kind of intrusion.

8 MR. RUSSO: Can you repeat that proposal?

9 DR. HALDERMAN: I think we can largely mitigate these
10 concerns, at least reduce them below the threshold that the
11 danger already exists in existing GEMS servers maintained by
12 the state if we apply -- if we apply both a physically
13 separated facility and a completely disconnected system.

14 MR. TYSON: So essentially -- this is Bryan Tyson.
15 So essentially duplicate our current setup in terms of how we
16 protect the information? Card key access? I think Michael
17 Barnes testified yesterday it is only five people. But I think
18 that is consistent with our current setup.

19 DR. HALDERMAN: Let's propose -- let's propose
20 either a card key or an independently locked door on a separate
21 security key from the rest of the building with a video camera
22 on the work station and a disconnected work station.

23 Would that be roughly equivalent or greater than the
24 normal security that is applied?

25 MR. TYSON: Merritt -- Mr. Beaver, do you want to

1 answer that in terms of what our current security is? I think
2 that's less than we currently do. But it is close.

3 THE COURT: Mr. Beaver, are you going to respond or
4 are you going to talk to your counsel and at least respond via
5 that way?

6 MR. RUSSO: Yes, ma'am. Sorry about that. Go ahead,
7 Merritt.

8 MR. BEAVER: I think anything more than looking at it
9 within our environment means it is out of our environment. No
10 matter what people say, they have got to control -- we don't
11 know what their controls are. But we can't -- I can't sit in
12 front of a judge and say -- answer the question how could it
13 have gotten out. If I said, well, I did release it, and they
14 said it was safe but now I can't explain how it got out there.

15 So anything less or anything more than looking at it
16 in our environment would still leave us exposed.

17 THE COURT: Are you able to make it available to the
18 experts in your environment if they come -- I mean, do you have
19 actual -- a capacity to do that?

20 MR. RUSSO: Well, Your Honor, I think some of that
21 would depend on are they looking to run software on the system
22 or what kind of protocol would be around that process. Just
23 look and our folks are there -- I think one of Judge Grubbs --
24 her points in the case before her, if we were going to let them
25 look at stuff, our folks had to be the ones touching it. Their

1 folks couldn't touch it. At least the Coalition had agreed to
2 that in that case also.

3 But I think we would need to have some protocol
4 around what they would be doing or whether our folks would be
5 the only ones touching the system and they are just there to
6 watch.

7 THE COURT: Let me just say there are different
8 focuses of this lawsuit versus a challenge in an election and
9 also the time frame that she had to deal with. So I respect
10 she did everything she could that she thought was proper in
11 that time frame.

12 But you don't -- I mean, let's say you made a copy of
13 whatever you had as if you had another computer doing this so
14 that it wouldn't in any way interfere with your functioning and
15 your system. Could they do it basically in your quarters so it
16 would be basically the same conditions? And maybe that is too
17 much of a layperson's question. But I think you get the drift
18 of what I'm saying probably.

19 MR. RUSSO: So I'm trying to make sure I understand
20 exactly what we're talking about here. So they would come --
21 they would be copying our system. I think we would have a
22 concern with the copying. We would be copying.

23 THE COURT: You would be copying.

24 DR. HALDERMAN: It would create --

25 **(Unintelligible crosstalk.)**

1 MR. RUSSO: We would create a separate duplicate
2 system.

3 DR. HALDERMAN: A mirror of the system -- the GEMS
4 system. Hold on a second.

5 MR. RUSSO: Your Honor, obviously our folks -- we're
6 concerned we're expanding even farther where we were before
7 because previously we were just talking about the GEMS
8 database. Now we're talking about copying the system.

9 THE COURT: I'm just -- let me just say I'm not
10 trying to do any one thing. I'm trying to throw out some other
11 ideas that could be massaged by people who understand the
12 issues probably better than me and how to do this in a way that
13 would satisfy some of your concerns but also actually deal with
14 the gravamen of also what the plaintiffs' claims are.

15 DR. HALDERMAN: Well, Your Honor, I gather that what
16 you are suggesting -- I think it is potentially a reasonable
17 proposal -- is to have a separate work station in a facility of
18 the State of Georgia's under Georgia's control where we
19 could -- the state could copy the data that we're asking for on
20 to a separate system or machine and we could go in and perform
21 the analysis ourselves on this independent computer there.

22 And that way there is no -- then it would be
23 protected to the same extent that it is in Georgia's existing
24 system. Is that -- is that what you were suggesting?

25 THE COURT: Yes.

1 DR. HALDERMAN: And I think we could perform the
2 analysis under those conditions. Although I think we could, in
3 fact, protect the data as well or better at our own laboratory
4 facilities where we routinely do deal with extremely serious
5 vulnerabilities in some of the internet's most -- most
6 dangerous malicious software.

7 But if the state insists, I think it would be
8 possible to perform the analysis on an independently setup
9 computer in their facility.

10 MS. CHAPPLE: Your Honor, this is Catherine Chapple.
11 I think we would also want to have assurance that they would
12 give Dr. Halderman and Mr. Bernhard the access and time that
13 they needed to do the analysis that they need to do. That it
14 wouldn't be an instance where our experts were told that they
15 only had a certain amount of time.

16 THE COURT: These are details that we'll put off for
17 now. All right. I mean, I understand that, the whole purpose
18 of this, especially if he doesn't have the computer to work on.
19 Yes. But let's just --

20 MS. CHAPPLE: Sorry, Your Honor.

21 THE COURT: That is all right. I don't mean to jump
22 on you about it. But I'm just trying to get any -- any sense
23 of what could be done here.

24 MR. RUSSO: Your Honor, I think we would want to get
25 a better understanding of what they mean by perform the

1 analysis on the machine and what tools they expect to be
2 introducing or -- I mean, we would be concerned about someone
3 introducing anything into the machines.

4 MR. BEAVER: It would have to be done based on what
5 is in the environment. As soon as you introduce other tools,
6 you, of course, bring the opportunity to bring something
7 foreign into that environment.

8 DR. HALDERMAN: Perhaps the state misunderstands the
9 proposal. We're talking about having a work station available
10 on which we can perform forensics and other tests on files
11 provided to us by the state.

12 MR. CROSS: And the key point just to add -- this is
13 David Cross -- is this is a stand-alone work station. So it is
14 not connected to the actual GEMS server. It would be whatever
15 room the state sets up as a stand-alone distinct machine that
16 is a mirror image of the GEMS server so that it wouldn't matter
17 what tools Dr. Halderman or Mr. Bernhard bring in because they
18 can only affect what is sitting on that stand-alone machine.
19 It is not connected to the internet. You can't infect
20 anything.

21 THE COURT: Well, it sounds like that is a
22 potentially reasonable alternative I have to say, and I'm not
23 expecting everyone to make a decision on the spot on a Friday
24 afternoon. But I am expecting you to think about it seriously
25 and -- but I do want to address -- I guess that was

1 Mr. Beavers' comment. But it might have been Mr. Russo's
2 comment.

3 Are we talking about when he asked -- one of you
4 asked, at least, were you talking about the GEMS database or
5 were you talking about the actual other operational -- the
6 server functioning? Is that what I understood you were asking,
7 one of you at least?

8 MR. RUSSO: Yes, ma'am. That is what we were trying
9 to get an understanding of.

10 THE COURT: All right. So knowing that -- I know
11 that the plaintiffs would like the whole deal. But,
12 Dr. Halderman and Mr. Bernhard, would it still be of value to
13 you, first of all, to do it just simply with the GEMS database
14 or not?

15 DR. HALDERMAN: This is Dr. Halderman. The GEMS
16 database would be of value to us. We would also like to
17 examine the rest of the server configuration and the data on
18 the GEMS server because the GEMS database is one in separate
19 places where malware could reside if the state says it is sort
20 of the nexus or the roadmap or the nerve center of the system.
21 So that might be the first place that would be fruitful to
22 examine.

23 THE COURT: What if you were allowed to do -- look at
24 the database and then they gave you whatever -- I mean, I
25 realize it is not what -- all the things you want, not quite

1 understanding what the macros are, but as a supplement to that.

2 DR. HALDERMAN: The macros are actually not a
3 substantial utility to us. I presume that that is a standard
4 check that the state runs in the normal course of business and
5 that it has already shown that there is not an infection there.

6 MR. CROSS: If I understand Your Honor's question
7 right, if the question is is the database itself a valuable
8 starting point, the answer is definitely yes.

9 THE COURT: If you were to do it under those
10 protected circumstances?

11 MR. CROSS: Yes. I mean the short answer is yes. I
12 guess I would want to explain though that, again, if we're
13 going to go to the trouble of looking even just at the database
14 on a stand-alone computer under the conditions we have
15 described, I would ask, Your Honor, we should just go ahead and
16 take the mirror image of the server because those conditions
17 are so secure that there is no reason to break it up. And it
18 is just going to create inefficiency and more work if we first
19 look at the database in that situation and then later have to
20 come back and create a whole new station that has the full
21 configuration of the server.

22 I mean, if we're going to go to those extreme
23 conditions, I would respectfully ask that we just do it all at
24 once and be done with it. If we're just getting the database,
25 then I would submit we don't need to do the level of

1 protections that they are talking about.

2 MR. BROWN: Your Honor, this is Bruce Brown. I have
3 to concur with what Dave said to this extent. The GEMS
4 database is set up in 159 counties. It is a public record in
5 other states. It is not the kind of data that needs the
6 protection anything close to what Dr. Halderman is describing.

7 Now, in terms of it is an order of magnitude and that
8 is why we chose it initially as the first thing that we wanted
9 discovery on because we didn't want to fight this thing on a
10 big forensic battle that, frankly, we had just gone through
11 with them in the lieutenant governor's case. We thought let's
12 just ask for the low hanging fruit, which is the GEMS database.
13 That will be a good start to try to get an overview of the
14 system and maybe spot some vulnerabilities or some
15 configuration errors.

16 And so it remains a good starting place. And we can
17 get those by CD. We don't need to have a safe room or anything
18 else. And we can evaluate them. And then that would probably
19 speed up what substantive review that could be entertained or a
20 concurrent review, even better, of the actual GEMS server.

21 But I think the difficulty that we had in our
22 discussion with the experts is that it is almost in a situation
23 where if what we are seeking discovery of is likely to reveal
24 malware or a vulnerability then the state is going to take the
25 position that it is beyond discovery every time, not just for

1 the GEMS database. But you will see that in discovery in this
2 case, I think, over and over again.

3 And so that is not a position that we feel
4 comfortable arguing because it just can't be so or else as
5 Justice Nahmias said in our oral argument in the other case it
6 is just this black box that the state gets to know how the
7 votes are counted and no one else does.

8 And so I think our discovery is limited. We have cut
9 it back to 25. If they have particular fields, like personal
10 information, that can be redacted. And we will treat them just
11 as carefully as they require the counties to treat them. And
12 whether that is done concurrently or in advance of making a
13 full image of the GEMS database -- you know, Mr. Cross has got
14 a good point. We'll take the GEMS database separately now.

15 Thank you.

16 THE COURT: Well, let me ask you this. We're talking
17 about the actual functioning of the GEMS server and the way it
18 operates. How further, Dr. Halderman, are you suggesting -- if
19 you were to happen to be in their shoes, what would you want,
20 in fact, to be able to protect -- when you have responsibility
21 for protecting the system, what would you want under these
22 circumstances?

23 They still have to run an election. Of course, it is
24 always possible as the plaintiffs have pointed out that things
25 won't be ready by the point of the primary or -- so it becomes

1 all the more important. So I may have unfairly put the shoe on
2 your foot about it.

3 DR. HALDERMAN: Yes. No. I think that is a fair
4 question. And I think that although the -- the information --
5 the most sensitive risk is that information on the real GEMS
6 servers will be changed, more so than information on the GEMS
7 servers will leak.

8 I think information on the GEMS servers needs to be
9 protected. And I think that the protective order is a good
10 place to work out the logistics of that. But the logistics to
11 me, the most important things, are to ensure that the data is
12 transferred in an encrypted way. Wherever it will be analyzed,
13 that it is analyzed on a system that is physically secured and
14 that physically secured system is disconnected from the
15 internet, in addition to the controls that the protective order
16 places on who would have access to that -- to that machine.

17 But that seems like -- that is a fairly standard
18 protocol for handling other kinds of dangerous or sensitive
19 software that, if released, could cause harm.

20 That is what we do to protect against -- to protect
21 actual virus samples. That is what we do sometimes to protect
22 the most severe vulnerabilities we discover is just make sure
23 that they are stored in encrypted form, that they are kept on
24 systems that are not connected to the internet, and to make
25 sure that those systems are physically secured.

1 THE COURT: All right. Let me just -- we were on the
2 protective order. And I had gotten everyone's position a
3 little more fully on the retroactivity issue and the state
4 wanting to assert an interest also to protect itself from the
5 disclosure of a third party.

6 I'm looking to see if there is anything else. I
7 would like the state to think about this alternative that we've
8 been discussing about the -- having this done in a state
9 facility on a mirrored machine computer. And obviously there
10 are two levels of this. And I hear what the plaintiffs are
11 saying. And I'm not -- I haven't necessarily heard anything
12 further from plaintiffs as to any sort of heightened obligation
13 of security relative to the experts who are using -- might be
14 doing this if they were actually looking at the server relative
15 to your desire to include your clients in the loop about
16 whatever they are doing.

17 And I think that I would be -- it is really no
18 disrespect to the clients. But I just -- I think under the
19 circumstances I couldn't probably authorize that. I don't see
20 any need to. I mean, the experts are going to do what they are
21 going to do and be looking at it.

22 But all of the details of all of that, as they are
23 running it, doesn't seem to be essential to be sharing with
24 clients until we -- obviously they will come to an opinion.
25 And that is something else when we get to the point that I have

1 an expert opinion.

2 MR. CROSS: Your Honor, this is David Cross for the
3 Curling plaintiffs. We have no objection. We certainly
4 understand and appreciate that. Our clients are fine with
5 that.

6 MR. BROWN: Your Honor --

7 **(Unintelligible crosstalk.)**

8 MR. BROWN: Your Honor, our client has no need or
9 desire to be a party to the examination of the server. If
10 we -- if you -- if I could explain better what the GEMS
11 database does, it is an Access database that is very much a
12 user-oriented application involving elections and how elections
13 are constructed.

14 And the knowledge of my client in terms of that field
15 of information is necessary for us to be able to review the
16 GEMS database itself. And that is why we would need to have my
17 client, Ms. Marks, included with any circle of people who were
18 reviewing the GEMS database. It is also simply a matter of
19 resources that we have to get this work done, quite frankly.

20 THE COURT: Are you saying she would need to be in
21 the room while they are looking at the database and they are
22 running the tests on the database?

23 MR. BROWN: She would not need to have --

24 THE COURT: So what are you saying? I mean, because
25 it wasn't like you wanted a printout of the database.

1 MR. BROWN: I may not -- we may have to put something
2 in writing to make sure it is clear. Because this is sort of
3 overtaken a little bit of my own understanding of how you could
4 view one and not the other.

5 But what we would want Ms. Marks to have access to
6 would be the functionality of the GEMS database, which is the
7 same thing that a county clerk in Georgia would have access to.
8 And we want to see the same thing that someone in an elections
9 office in Morgan County would have access to. And they, of
10 course, don't have access to the kinds of things that
11 Dr. Halderman is talking about. So that would be sort of a
12 rough way of explaining it. We would need it to be able to get
13 our work done with our resources and would appreciate that.

14 THE COURT: When it is made available in Morgan
15 County -- and the state may be -- I assume can answer that
16 question whether directly Mr. Beaver or his giving the
17 information to counsel.

18 What does that mean? Are they -- when the county
19 elections officer is looking at it, is he or she looking at it
20 on a computer and able to do all the things that Mr. -- that
21 the plaintiffs want to do or are they looking at it -- pulling
22 it up in some other less informative mode but that you can run
23 it?

24 MR. TYSON: Yes, Your Honor. This is Bryan Tyson.
25 We had an extensive discussion of this in Mr. Barnes'

1 deposition yesterday. And the county election officials have
2 separate GEMS computers that house the Access database. But an
3 important distinction is that the county computers do not have
4 Microsoft Access installed on them. So the county officials
5 cannot open the database in Microsoft Access.

6 They use the GEMS system that then provides the
7 interaction to the Access database. But they do not and cannot
8 open it because those computers are not connected to anything
9 and Microsoft Access is not installed on those computers.

10 THE COURT: Okay. So back to you, Mr. Brown. I
11 mean, is that -- if you want to see it the way that the Morgan
12 County elections is, then you would be looking at it and your
13 client would be looking at it --

14 MR. BROWN: Well, I think --

15 THE COURT: -- in a separate way without access --
16 without the --

17 MR. BROWN: What we would want is -- what we have
18 asked for is to have it saved as a Microsoft Access database.
19 Then we simply open it in Microsoft Access and be able to
20 analyze it like that.

21 THE COURT: Well, I just don't understand why your
22 client has to be part of that, frankly. I mean, you originally
23 say you want it just like the Morgan County head of elections
24 is. But then you actually wanted something else, which is what
25 basically I'm saying, well, I can understand why the experts

1 might need it but I'm not sure why that makes -- why your
2 client has to be part of that process.

3 All right. Well, you can all think about that. And
4 the state should think what -- what we have been discussing.
5 And I would like to know by 11:00 on Monday what your
6 respective positions are.

7 MR. BROWN: Thank you, Your Honor. We will brief the
8 issue of who should have access and why to the GEMS database
9 and also provide a little bit more information on the GEMS
10 database and how it is helpful and should be disclosed. But
11 thank you very much for your time.

12 THE COURT: And if the state would indicate -- mull
13 over what we have been discussing and indicate its -- its
14 position as well by 11:00.

15 MR. RUSSO: Yes, ma'am. We will do that. This is
16 Vincent Russo. We will do that and follow up by 11:00.

17 Should we just email your clerk, or would you --

18 THE COURT: You can file it under seal. I mean, it
19 is just the simplest thing at this point given the subject
20 matter. Everyone can file it under seal, and then we'll --
21 once I see it, then I'll decide whether all of it needs to be
22 under seal.

23 MR. RUSSO: Yes, Your Honor.

24 THE COURT: And if there is something that is
25 relevant from the deposition, I guess you'll need to file the

1 deposition.

2 MR. RUSSO: Just so we fully understand here, you're
3 referring to Michael Barnes' deposition?

4 THE COURT: That is what I understood from the state
5 was that there was a deposition that dealt with these issues.

6 MR. RUSSO: Correct.

7 THE COURT: Okay. I'm just looking at the protective
8 order statement so I can see if there was anything else I
9 needed to ask you about.

10 All right. I think I have -- if there is anything
11 else that arose today that you have further information about
12 or a modified position on, please provide that for me. And if
13 either of the experts have anything -- further clarification
14 that they want to provide, they should -- you should attach an
15 affidavit or from Mr. Beaver.

16 All right. Thank you very much. Have a good
17 weekend.

18 MS. CHAPPLE: Thank, Your Honor.

19 MR. BROWN: Thank, Your Honor.

20 **(The proceedings were thereby concluded at 4:25**
21 **P.M.)**

22

23

24

25

C E R T I F I C A T E

UNITED STATES OF AMERICA

NORTHERN DISTRICT OF GEORGIA

I, SHANNON R. WELCH, RMR, CRR, Official Court Reporter of the United States District Court, for the Northern District of Georgia, Atlanta Division, do hereby certify that the foregoing 53 pages constitute a true transcript of proceedings had before the said Court, held in the City of Atlanta, Georgia, in the matter therein stated.

In testimony whereof, I hereunto set my hand on this, the 29th day of June, 2019.

Shannon R. Welch

SHANNON R. WELCH, RMR, CRR
OFFICIAL COURT REPORTER
UNITED STATES DISTRICT COURT

UNITED STATES DISTRICT COURT
OFFICIAL CERTIFIED TRANSCRIPT

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(No exhibits marked.)

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1 APPEARANCES:

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Mr. William Risner, Attorney at Law
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Tucson, Arizona 85701
For Plaintiff

Mr. Thomas Denker, Attorney at Law
Ms. Karen Friar, Attorney at Law
Pima County Attorney's Office
32 North Stone Avenue, Ste. 2100
Tucson, Arizona 85701
For Defendants

ALSO PRESENT: Mr. Jim March
Mr. John Moffatt

* * * *

14

15 BE IT REMEMBERED that pursuant to Notice of
16 Taking Deposition in the above-styled and numbered
17 cause, of the deposition of MERLE KING was taken upon
18 oral examination at the offices of Risner & Graham,

100

19 North Stone Ave., in the City of Tucson, County of
Pima,

20 State of Arizona, before me, Mary Meyer, RPR,
Certified

21 Reporter 50225, in and for the State of Arizona, on
the

22 8th day of November, 2007, commencing at the hour of
23 9:02 a.m. on said day.

24

25 * * * *

4

1 MERLE KING,

2 having been first duly sworn, was examined and
testified

3 as follows:

4 EXAMINATION

5 BY MR. RISNER:

6 Q. Tell the judge your name. I'm not sure if that
7 got on the record.

8 A. I'm Merle King.

9 Q. And I want to ask you a little about your
10 background. So, would you describe your educational
11 background.

12 A. I have a bachelor's degree in biology, a
master's
13 in business administration, and a master's in business
14 information systems.

15 Q. And where did you get this business
16 administration, business information systems master's?
17 I mean --

18 A. Georgia State University, Atlanta, Georgia.

19 Q. In what year?

20 A. 1989.

21 Q. And if you could give me some work history,
22 please.

23 A. I am an associate professor of information
24 systems. I've been in the professorate since 1979. I
25 am past chair of the Department of Computer Science

and

5

1 Information Systems, and currently the executive
2 director of the Center for Elections Systems.

3 Q. And as an associate professor, that's at

4 Kennesaw?

5 A. That's correct.

6 Q. And do you teach any at Kennesaw?

7 A. I teach infrequently. It's been a year since I
8 taught a course.

9 Q. What kind of courses have you taught?

10 A. I teach graduate courses in legal issues and in
11 information technology and information technology
12 leadership.

13 Q. What are -- what areas are you an expert in?

14 A. I have experience in election technologies,
15 election administration, computer science education.

16 Q. What's your level of expertise with software?

17 MR. DENKER: Objection, form and foundation.

18 A. What software? Which software?

19 Q. (By Mr. Risner) Well, let's say the GEMS
20 software.

21 A. I'm familiar with GEMS software, with its
22 architecture and its function.

23 Q. And how did you get that familiarity?

24 A. The State of Georgia has used GEMS since 2002.

25 Through our center's use of that software, I've gained

1 familiarity with them.

2 Q. And is that through your using of the software?

3 A. That's correct.

4 Q. Are you -- have you done a source code review
of that software?

6 MR. DENKER: Objection, form and foundation.

7 A. I have not done a source code review; however,
I have looked at the source code for the software.

9 Q. (By Mr. Risner) What does that mean?

10 A. Well, a source code review is a formal process
of reviewing the entire body of code --

12 (Mr. John Moffatt enters conference room.)

13 -- the genesis of the body of code, the
14 functionality of the body of code. So, I have not
done a source code review of the software. I have,
however, inspected the source code when I was curious about how
a particular function worked.

18 Q. (By Mr. Risner) What -- I don't understand
what you mean when you inspected it because you were
curious.
20 What does that mean?

21 A. Looking at the source code to understand how an

22 operation works within the system.

23 Q. And how did you get that source code?

24 A. Kennesaw State is the escrow agent for GEMS in
25 the State of Georgia. The source code was delivered
to

7

1 us from what, at that time, was called the ITA,

2 Independent Testing Authority.

3 Q. Which ITA?

4 A. Cyber.

5 Q. And when was that delivered to you?

6 A. I don't know.

7 Q. And what was it you were looking for when you
8 looked in --

9 A. I don't recall the specifics.

10 Q. Was it a particular thing that you were looking
11 for?

12 MR. DENKER: Objection, form and foundation.

13 A. I don't recall whether it was specific or if it
14 was a general.

15 Q. (By Mr. Risner) And what -- when was it?

16 A. I don't recall.

17 Q. Have you ever consulted for Diebold
Corporation?

18 A. I have not.

19 Q. So they've not paid you at any time?

20 A. No.

21 Q. In this case, you've been hired, have you not,
by
22 Pima County for some consulting and testifying?

23 A. We have discussed. I have not signed a
contract
24 with Pima County.

25 Q. So, what have you discussed with Pima County?

8

1 MR. DENKER: Objection, form and foundation.

2 A. Reimbursement for expenses.

3 Q. (By Mr. Risner) And how about your time? Are
4 you being paid separately for that?

5 A. I've asked that my time be reimbursed for a
total
6 of \$10, a check payable to the foundation at my
7 university.

8 Q. And who contacted you from Pima County?

9 A. Karen Friar.

10 Q. And do you know how she got your name?

11 A. I believe it was from Brad Nelson.

12 Q. And do you know how Brad Nelson knows of you?

13 MR. DENKER: Objection, form and foundation.

14 A. Brad was at a conference at which I made a
15 presentation.

16 Q. (By Mr. Risner) What conference was that?

17 A. I think it was CERA, C-E-R-A.

18 Q. What's that mean?

19 A. It's the organization that provides continuing
20 education to county -- I'm sorry -- to election
21 officials.

22 Q. And what was your presentation about?

23 A. Ballot building.

24 Q. And when was that made?

25 A. I'd have to consult my calendar. It was
sometime

9

1 within the past 18 months.

2 Q. And were you paid separately for that
3 presentation?

4 A. I was not paid nor reimbursed for travel
5 expenses.

6 Q. So why are you appearing here for just 10 bucks
7 for your time?

8 A. Well, I was asked to, is one. The second is
that
9 I'm concerned about the integrity of elections.

10 Q. What do you mean by that?

11 A. I'm interested in doing what I can to make sure
12 that elections run smoothly, not only in the State of
13 Georgia, but wherever I can provide advice to a
14 jurisdiction.

15 Q. What do you mean by "smoothly"?

16 A. Well, that's a good question. "Smoothly" means
17 without contesting results, without anomalies in the
18 process.

19 Q. And do you have -- what is your understanding
of
20 the issues involved with this lawsuit that would
impact
21 the smooth operation of elections?

22 A. I'm not sure I understand your question.

23 Q. Well, I take it that there's something about
this
24 case that you feel impacts that goal of smooth
25 operations, and I'm wondering what that is.

10

1 A. Well, I don't -- I don't know that the aspects
of
2 this case impact my impression of smooth operations.

3 The case, as I've read, it focuses on the
request

4 for a copy of the GEMS database. The release of GEMS
5 databases to the public gives me concern.

6 MR. RISNER: Okay. Incidentally, I'd like the
7 record to reflect that John Moffatt is present.

8 Q. (By Mr. Risner) What is it about the release
of
9 the GEMS database that gives you concern?

10 A. Because of information that's contained within
11 the GEMS database, specifically user IDs, passwords.

12 Q. And what's the problem with that?

13 A. Organizations typically work diligently to
14 protect the security of user IDs and passwords.

15 Q. And what else would give you concern about the
16 release of the database?

17 A. The structure of the database is consistent
18 through all jurisdictions that use GEMS, so the
19 revelation of one jurisdiction's database structure
20 reveals information -- potentially reveals information
21 about other jurisdictions.

22 Q. Any other problems you see with releasing the
23 database?

24 A. There are potential intellectual property
issues,
25 but that's jurisdiction dependent, and I'm not
familiar

1 with Arizona law to know whether that's an issue here.

2 Q. So that's -- those things are your concerns?

3 A. Yes.

4 Q. Okay. And have you -- what have you been asked
5 to do in this case?

6 A. Well, I've been asked to give an opinion on
7 whether the GEMS database constitutes a computer
program

8 as defined by Arizona statute.

9 (Karen Friar enters conference room.)

10 Q. (By Mr. Risner) And any other opinions you've
11 been asked to give?

12 A. I've been asked to give an opinion on the
13 security implications of releasing the database.

14 Q. Anything else?

15 A. Not that I can recall.

16 Q. What is your opinion, then, on whether the GEMS
17 database constitutes a computer program as defined by
18 Arizona statute?

19 A. I believe that it does.

20 Q. And which Arizona statutes are you -- have you
21 consulted?

22 A. Perhaps you're more familiar with the code.

23 (Hands document to Mr. Risner.)

24 Q. You've handed me what I believe is ARS 16-444,
25 the definitions applicable, generalized. Which one of

12

1 those definitions have you looked at?

2 A. Definition four.

3 Q. Four.

4 A. Paragraph four.

5 Q. And, okay, so why do you think that a GEMS
6 database constitutes a computer program as defined by
7 that?

8 A. I'm sorry. Could you repeat the question?

9 Q. Yeah. So why do you think a GEMS database
10 constitutes a computer program as defined by that
11 statute?

12 A. Computer program includes all programs and
13 documentation adequate to process the ballots. You
14 cannot process the ballots without GEMS.

15 Q. Anything else?

16 A. No.

17 Q. And the security implications, what's your
18 opinion on that?

19 A. The release of the GEMS database reveals the
20 structure of the database. The revelation of the

21 structure may give hackers insights into how to
22 construct a workable attack against the GEMS system.

23 Q. Anything else?

24 A. No.

25 Q. Let me go back to a couple of these things.
You

13

1 expressed concern that the turning over of the
database

2 would reveal user IDs.

3 A. That's correct.

4 Q. Is that correct?

5 A. (No oral response.)

6 Q. Yeah. How difficult is it to change user IDs?

7 MR. DENKER: Objection, form and foundation.

8 A. To change user IDs in GEMS?

9 Q. (By Mr. Risner) Yeah.

10 A. That is a normal procedure, a normal function
11 that's made available in the system, so it's not
12 difficult.

13 Q. And in good computer security practice, should
14 user IDs be changed from time to time?

15 MR. DENKER: Objection, form and foundation.

16 A. That is an accepted practice in security.

17 However, revealing the syntax rules for the user IDs
18 should never be revealed.

19 Q. (By Mr. Risner) What's that mean?

20 A. For example, if an organization constructs user
21 IDs out of, say, the first letter of the first name
and
22 the last name, that reveals the syntax that may be
23 useable by hackers to launch an attack against the
24 system.

25 So, changing pass -- or user IDs is an accepted

14

1 good practice. Revealing the syntax for them would be
2 considered poor security.

3 Q. Have you seen the codes on GEMS user IDs?

4 MR. DENKER: Objection, form and foundation.

5 A. Which installation?

6 Q. (By Mr. Risner) The encryption process.

7 A. Have I seen the encryption process?

8 Q. Yeah.

9 A. No. That's not a doable process, but I'm not
10 alone in not having seen it.

11 Q. Do you know what Pima County uses for user ID?

12 A. I do not.

13 Q. And do you know if they have more than one user

14 ID, depending on the person that's operating the
system?

15 A. I do not.

16 Q. And the same thing with passwords, do you know
17 what -- whether passwords should be changed regularly?

18 A. Passwords should be changed regularly.

19 Q. And is that difficult, also?

20 A. It is not difficult.

21 Q. Okay. So, in terms of the user ID and
passwords

22 as reasons not to give the database to the Democratic
23 Party, are those weighty at all?

24 A. They are weighty.

25 Q. Huh?

15

1 A. They are weighty.

2 Q. They are?

3 A. Because it reveals the syntax of the user IDs.

4 MR. DENKER: Would you reflect a form and
5 foundation objection to that previous question. Thank
6 you.

7 Q. (By Mr. Risner) You mentioned that the
structure

8 of the database is consistent in all jurisdictions.

9 A. That use GEMS.

10 Q. Yeah. So, if the database was revealed here,
11 then that would create a problem other places?

12 A. That's speculative. I don't know that it would
13 create problems in other places, but it would give
14 potential hackers insight into the database structure
15 used in other GEMS based jurisdictions.

16 Q. Are you aware that the Democratic Party in the
17 State of Alaska received a copy of the database?

18 A. I have read that. I don't know the details of
19 it.

20 Q. You think that has created a problem, then,
from giving information to hackers?

22 MR. DENKER: Objection, form, foundation.

23 A. I think it increases the risk.

24 Q. (By Mr. Risner) Yeah, and if the Pima County
25 Democratic Party got the database, how much increase

16

1 would that be in the risk?

2 MR. DENKER: Objection, form, foundation.

3 A. I can't speculate on the perception increase or
4 whatever metric.

5 Q. (By Mr. Risner) Yeah. In terms of the user

ID,

6 is a good practice to have one ID shared by several
7 people or to have individual user IDs?

8 A. That's a poor practice.

9 Q. Which one?

10 A. Having a single ID shared by more than one
user.

11 Q. Do you know that Pima County uses "admin" as
the
12 user ID only?

13 MR. DENKER: Objection, form, foundation.

14 A. That they currently use "admin" only?

15 Q. (By Mr. Risner) Yeah. Yeah.

16 A. I do not know that.

17 Q. What do you think about that practice, if
that's
18 the case?

19 A. Repeat your first question.

20 Q. Sure.

21 A. Okay.

22 Q. If Pima County uses "admin" as the user ID for
23 everyone who's on the computer, is that a good
security
24 practice?

25 A. On the surface, it would certainly seem not to

1 be. Usually the administrator is a single individual.

2 Q. What do you know about Arizona's public
records?

3 MR. DENKER: Objection, form and foundation.

4 A. I don't know. I don't know.

5 Q. (By Mr. Risner) Yeah. And what do you know
6 about the security of, or how the security's operated
7 in, Pima County with their election central count
8 computer?

9 MR. DENKER: Objection, form, foundation.

10 A. I spent approximately two-and-a-half hours at
the
11 center yesterday and was given a high level overview
of
12 some of the current security procedures at the center.

13 Q. (By Mr. Risner) Okay. And were you informed
of
14 the various changes that had been made within the last
15 couple of years?

16 A. I was informed of some changes. I don't know
if
17 I was given the complete list of changes.

18 Q. And did they mention what role the Pima County
19 Democratic Party had played in increased security in
20 Pima County?

21 A. I understand the Pima County Democratic Party
was

22 instrumental in raising some of the issues that led to
23 policy changes.

24 Q. In your state of Georgia, how involved are
25 political parties in ensuring the accuracy of
elections?

18

1 MR. DENKER: Objection, form, foundation.

2 A. I would say not much.

3 Q. (By Mr. Risner) And at what level are they
4 involved?

5 MR. DENKER: Objection, form, foundation.

6 A. I'm -- I can't think of a single instance in
7 which we have had interaction with either the
Democratic
8 or Republican Party on an election issue.

9 Q. (By Mr. Risner) Well, in Georgia, who conducts
10 oversight to make sure that the elections are
accurate?

11 MR. DENKER: Objection, form, foundation.

12 A. Ultimately, the secretary of state is the chief
13 election officer, and the responsibility for election
14 administration is in the Elections Division of the
15 secretary of state's office, with the exception of
16 municipal elections.

17 Q. (By Mr. Risner) At the end of an election, do

18 they audit counties to see -- you know, for instance,
19 take a look at GEMS, to see that it's all operated
20 properly?

21 A. The secretary of state's office has requested
22 post-election audits on elections over the years.

23 Q. Okay. And who does those? Does your group do
24 it?

25 A. We provide technical support, but investigators

19

1 within the SOS office conduct the investigation.

2 Q. What kind of investigations have they done?

3 MR. DENKER: Objection, form, foundation.

4 A. One objection -- or, I'm sorry, one
investigation

5 was on allegations of machines not working properly in
a

6 precinct.

7 Q. (By Mr. Risner) Yeah, so what -- what did they
8 do with that, do you know?

9 A. The machines were quarantined. Investigators
10 performed tests on the machines. In that particular
11 case, the complainant failed to show to the
12 investigation, which shortened the investigation
13 considerably, primarily confirming that the machines

14 work as designed.

15 Q. Yeah. And when was that investigation, do you
16 know?

17 A. It was approximately three years ago.

18 Q. Yeah. Can you think of any others?

19 A. Any others that relate to what?

20 Q. Anything. You know, just where the secretary
of
21 state -- you said, if I understand you, that the
22 secretary of state can send investigators and do an
23 investigation.

24 A. That's correct.

25 Q. And if I understand you, your group that you're

20

1 the executive director of has been the technical
advisor
2 of this.

3 A. That's correct.

4 Q. So, I'm asking if you can think of any others,
5 other than the one you just talked about?

6 A. Most investigations that are initiated by the
7 secretary of state's office deal with voter fraud that
8 deal with paper ballots. That does not involve our
9 organization.

10 Q. Yeah. Yeah. How do you determine in Georgia
11 whether some insiders in the county haven't rigged the
12 computer to get the results the way they want?

13 MR. DENKER: Object to form and foundation.

14 A. That's a very presumptive question. That's
well
15 beyond the scope of my unit.

16 Q. (By Mr. Risner) Excuse me?

17 A. That is well beyond the scope of my unit. We
do
18 not do criminal investigations.

19 Q. How many counties do you have in Georgia?

20 A. 159.

21 Q. And so do you all just assume that all 159 are
22 not cheating?

23 MR. DENKER: Objection, form, foundation.

24 A. I assume nothing.

25 Q. (By Mr. Risner) Huh?

21

1 A. I assume nothing.

2 Q. Well, who checks to see if there's insiders
3 cheating?

4 MR. DENKER: Objection, form, foundation.

5 A. The responsibility for each county election

falls

6 upon either the superintendent of elections, appointed
7 by a board of elections in that county, or on the
8 probate court judge for that county. That is their
9 responsibility, to investigate -- at least to initiate
10 any investigations of impropriety within their
counties.

11 Q. (By Mr. Risner) Okay. So, if somebody caught
12 something, they could go to court and ask one of these
13 superintendents to investigate. Is that what you're
14 saying?

15 MR. DENKER: Object to form and foundation.

16 A. I don't know the procedure that an individual
may
17 take.

18 Q. (By Mr. Risner) Well, what I'm just wondering
19 is, as a regular process, is there anyone that audits
20 and checks to see that the county -- 159 counties are
21 doing it right?

22 A. The superintendent of elections for that
county.

23 Q. And do you know what they look at?

24 A. I think that would depend upon the allegation.

25 Q. Yeah. So there has to be a specific
allegation,

1 in other words?

2 A. I would think so.

3 Q. Okay. And your group doesn't give suggestions
or

4 technical advice or anything like that. Would that be
5 right?

6 MR. DENKER: Object to form, foundation.

7 A. Technical advice to whom?

8 Q. (By Mr. Risner) The superintendent of
elections

9 in the various counties.

10 A. If a request for technical advice comes from a
11 superintendent, we would typically provide that
advice,

12 unless there was some reason given to us by the
13 secretary of state not to.

14 Q. So, have you ever gotten a request from one of
15 those superintendents of elections for technical
advice?

16 A. Oh, all the time.

17 Q. Yeah, in terms of checking to see if insiders
18 have been cheating?

19 A. No.

20 Q. Who, under Georgia law, has the right to
observe

21 the counting of the vote?

22 MR. DENKER: Objection, form and foundation.

give 23 A. I would have to consult the election code to
24 you the specifics, but generally it's the public. The
25 public have the right.

23

1 Q. (By Mr. Risner) Do you have -- do political
2 parties have any special observation rights?

3 A. (No oral response.)

4 Q. Huh?

5 A. Not that I'm aware of.

6 Q. Are you aware of what Arizona law provides for
7 rights of political parties to monitor and observe
8 elections?

9 MR. DENKER: Objection, form, foundation.

10 A. I'm becoming aware of it, but I'm not
11 knowledgeable of Arizona code in that regard.

becoming 12 Q. (By Mr. Risner) So who's -- how are you
13 aware of that?

14 A. Reading the statutes.

15 Q. So, have you learned that we have kind of a
16 different system than Georgia?

17 MR. DENKER: Objection, form, foundation.

18 A. I'm learning that, yes.

19 Q. (By Mr. Risner) In Georgia, your secretary of
20 state, or legislature, somebody decided to buy all
21 direct recording machines, didn't they, for elections
in Georgia?
22

23 MR. DENKER: Objection, form, foundation.

24 A. The State of Georgia uses DREs and optical scan
25 technology to support elections.

24

they 1 Q. (By Mr. Risner) Yeah, and when -- when did
2 make that decision?

3 A. March of 2002.

4 Q. And Georgia uses all Diebold equipment?

5 MR. DENKER: Objection, form, foundation.

6 A. For county based elections, yes.

7 Q. (By Mr. Risner) What does that mean?

8 A. Municipalities have the discretion to hold
9 elections on technologies other than DRE and optical
10 scan.

11 Q. Okay. So, cities and towns can use something
12 different?

13 A. That's correct.

14 Q. All right. But the -- if it's a county

election

15 or state election, they use Diebold equipment?

16 A. That's correct.

up

17 Q. And how is that sort of just generally divided

18 between the DREs and the optical scans?

19 MR. DENKER: Objection, form, foundation.

20 A. Optical scan is used for mail-in, absentee

early

21 ballots. DRE's used for polling place voting and

22 voting.

23 Q. (By Mr. Riser) How is early voting different

24 than absentee?

25 A. Early voting is in person, in a central polling

25

1 place.

2 Q. And when -- what role did you play, if any, in

3 the decision to use all DREs at the polling places?

4 A. No role.

5 Q. Were you asked for advice?

6 A. No.

state

7 Q. And Georgia was the -- were they the first

8 to do this, to use all DREs?

9 A. My understanding, yes.

10 Q. And were these the TS machines?

11 A. I'm not sure if I follow your question.

12 Q. Well, what machines were used?

13 MR. DENKER: Objection, form, foundation.

14 A. The DRE units --

15 Q. (By Mr. Risner) Yeah.

16 A. -- are model R6.

17 Q. Are you familiar with the term TS or TSX?

18 A. Well, yes, I am.

19 Q. Okay. Yeah. So, is the R6 also known as the
TS?

20 A. By whom?

21 Q. Heck, I don't know. I see it in all these
22 reports, you know.

23 A. TS is an acronym that stands for touch screen.

24 Q. Yeah.

25 A. Many companies produce TS units, touch screen

26

1 units.

2 Q. Okay.

3 A. Diebold refers to this model that we use as the
4 R6 unit. They have another unit, the TSX, and that is

a

5 unique model number.

6 Q. Okay. So, TSX is a unique model number of
7 Diebold, right?

8 A. That's correct.

9 Q. And a lot of folks call this other unit TS, but
10 among Diebold they actually call it an R6?

11 A. That's correct.

12 Q. Is that what --

13 A. Well --

14 MR. DENKER: Objection, form, foundation.

15 A. Well, the unit that we use in Georgia is the
16 Diebold R6 unit.

17 Q. (By Mr. Risner) And is that the same unit that
18 Volusia County in Florida uses, do you know?

19 A. I don't know.

20 Q. I just -- I may have the wrong county, but I
was

21 thinking, wasn't there some county, in 2006, in
Florida,

22 where there were, you know, 16,000, a whole bunch of
23 votes that weren't recorded at all?

24 MR. DENKER: Objection, form, foundation.

25 Q. (By Mr. Risner) Do you know anything about
that?

1 A. I'm not sure I follow your question.

2 Q. I'm just trying to remember from news
broadcasts,

3 but I think there was an election for Congress, the
4 United States House of Representatives, in 2006, and
5 some county in Florida, there were, I'm thinking
16,000,

6 I may be wrong, a whole bunch of votes that simply
7 weren't recorded on those machines. Does that ring a
8 bell with you?

9 A. If you're referring to the ES&S machines used
in
10 Sarasota, Florida, there's been allegations, although
at

11 this point unsubstantiated allegations, that the ES&S
12 machines used in Sarasota, Florida, recorded
significant

13 under-votes for a congressional seat. Is that what
14 you're referring to?

15 Q. Yeah, that sounds right, yeah.

16 So, were those touch screen machines?

17 A. The ES&S machines?

18 Q. Yeah.

19 A. Yes.

20 Q. And do you know what the problem was with those
21 machines or what happened down there?

22 MR. DENKER: Objection, form, foundation.

23 A. No.

28

24 Q. (By Mr. Risner) So, do you know anything about
25 the -- about Pima County's election staff's level of

1 competence?

2 MR. DENKER: Objection, form, foundation.

3 A. No.

4 Q. (By Mr. Risner) And I would say the same thing
5 about Brad Nelson, do you know if he has any knowledge
6 about how these computer systems work?

7 MR. DENKER: Objection, form and foundation.

8 A. I am not knowledgeable of Mr. Nelson's
9 competence.

10 Q. (By Mr. Risner) And has Pima County discussed
11 with you the security changes that they plan to make
in
12 the future?

13 MR. DENKER: Objection, form, foundation.

14 A. I have read, I believe, an outline of those
15 changes, but I have not discussed those changes with
16 anybody in Pima County.

17 Q. (By Mr. Risner) So what's your understanding
of
18 the changes that they plan on making?

19 A. Are you talking about any change specifically,

or

20 the global set of changes?

21 Q. Just give me the global set. I want to find
out

22 what you know about it.

23 A. I think the goals are laudable. I think the
24 implementation may be problematic.

25 Q. Yeah. What's your understanding of what
changes

29

1 that they're planning on making?

2 A. I would have to look at the document.

3 Q. Do you know what the summary report is in the
4 GEMS system?

5 A. Yes.

6 Q. And what's your understanding of when those
7 reports should be printed?

8 MR. DENKER: Objection, form, foundation.

9 A. That's a jurisdiction issue.

10 Q. (By Mr. Risner) Yeah. What does that mean?

11 A. It means, the State of Arizona, Pima County,
any

12 municipality, whatever is using that technology,
decides

13 when and by whom those reports are issued.

14 Q. Do you know what the GEMS manual says about it?

15 A. No.

16 Q. What's the situation in Georgia?

17 A. I would have to consult a county superintendent
18 to know what the practice is in Georgia for the use of
19 the summary report.

20 Q. You would consult who?

21 A. The county superintendent, a superintendent of
22 elections.

23 Q. So, for you to know what it is in Georgia, you
24 need to call one of these 159 guys and ask them?

25 A. I would want to make sure that I am well-versed

30

1 on how it is used in that particular county.

2 Q. There's not a state law?

3 A. No.

4 Q. Any state rules?

5 A. No.

6 Q. No secretary of state regulations on it?

7 A. Not that I'm aware of.

8 Q. Are you aware that the Democratic Party in this
9 case has not requested a copy of GEMS?

10 MR. DENKER: Objection, form, foundation.

11 A. I am not aware of -- I'm trying to answer that
12 question. You asked a negative. I have no knowledge
of
13 the Democratic Party requesting a copy of GEMS.

14 Q. (By Mr. Risner) Right. So then you would
agree
15 that, to your understanding, the Democratic Party has
16 not requested a copy of GEMS?

17 A. That's correct.

18 Q. Yeah, and that the Democratic Party has
requested
19 a copy of the database?

20 MR. DENKER: Objection, form, foundation.

21 A. That's correct.

22 Q. (By Mr. Risner) And earlier, if I understood
23 your answer, you said that, in your opinion, 16-444,
24 that GEMS was a computer program?

25 A. No --

31

1 MR. DENKER: Objection to form, foundation.

2 A. -- the GEMS database.

3 Q. (By Mr. Risner) What's the difference between
a
4 database and a computer program?

5 MR. DENKER: Objection, form, foundation.

6 Q. (By Mr. Risner) In general.

7 A. Are you presuming there is a difference?

8 Q. I'm just -- you're the expert. I may ask a
dumb
9 question. Yeah, I'm presuming there's a difference,
but
10 tell me if there's not.

11 A. In the Arizona statute, as I understand it, if
I
12 can read it just to refresh my memory, it states --
may
13 I do so?

14 Q. Yeah, but my question at the moment relates to
15 just, in general, computer technology usage.

16 A. A computer program is a set of stored --

17 MR. DENKER: Objection, form, foundation. Go
18 ahead. Sorry.

19 A. A computer program is a set of stored
20 instructions that causes a computer system to
accomplish
21 a task.

22 Q. (By Mr. Risner) And what's a database?

23 A. A database is a complex data structure that
24 contains both data and objects, of which those objects
25 can be executable code, as well as metadata.

1 Q. Does the GEMS database contain executable code?

2 A. It does in the form of SQL queries.

3 Q. Do you know if the SQL in the database is
4 interpretable code, or is it just in the database as a
5 byproduct of Diebold's choice of Microsoft Access as a
6 database?

7 MR. DENKER: Objection, form, foundation.

8 A. I don't know.

9 Q. (By Mr. Risner) What's the function of those
SQL
10 queries in the database?

11 A. Used to support report generation.

12 Q. Does GEMS generate the SQL codes?

13 MR. DENKER: Objection, form, foundation.

14 A. Yes.

15 Q. (By Mr. Risner) Is that self-modifying code?

16 A. The SQL?

17 MR. DENKER: Objection, form, foundation.

18 Q. (By Mr. Risner) Yeah.

19 A. No.

20 Q. Between -- the combination between GEMS and the
21 SQL in the database, is that self-modifying code?

22 A. No.

23 MR. DENKER: Let me reflect an objection to the
24 last question, as well. Thank you.

25 MR. RISNER: What was the objection?

33

1 MR. DENKER: Form and foundation.

2 Q. (By Mr. Risner) You know what self-modifying
3 code is, don't you?

4 A. I know what a technical definition of
5 self-modifying is.

6 Q. Did you understand my question?

7 A. I did.

8 Q. If -- the SQL in the database, is that
9 interpreted code?

10 A. It is.

11 Q. Do you know whether the federal certification
12 process treated that code as data or as code?

13 A. I do not.

14 MR. DENKER: Objection, form, foundation.

15 Q. (By Mr. Risner) Do you understand the federal
16 certification rules in the federal manual for the ITAs
17 to do certification?

18 MR. DENKER: Objection, form, foundation.

19 A. ITAs no longer do certification.

20 Q. (By Mr. Risner) Okay. How about if we change
21 the term to qualification.

22 MR. DENKER: Same objection.

23 A. I'm not sure I can answer your question.

24 Q. (By Mr. Risner) Are you familiar with the 2002
25 voting system standards?

34

1 MR. DENKER: Objection, form, foundation.

2 A. I'm not familiar with a document that you're
3 describing.

4 Q. (By Mr. Risner) Are you familiar with some
5 standards called VBSG?

6 A. Yes.

7 Q. And the 1990 and 2002 editions?

8 A. 1990 was not called the VBSG.

9 Q. What was that called?

10 A. That was the VSG.

11 MR. RISNER: I think I want to take a break.

12 (Break taken, 10:01 to 10:11 a.m..)

13 Q. (By Mr. Risner) Yeah, Mr. King --

14 A. Yes.

15 Q. -- is it true that the program code has to be
16 scrutinized by the ITAs --

17 MR. DENKER: Objection, form, foundation.

18 Q. (By Mr. Risner) -- pursuant to the federal

19 rules?

20 A. What do you mean, "scrutinized"?

21 Q. You know, these Independent Testing Authorities

22 have to look at certain code, don't they --

23 A. They do.

24 Q. -- source code? Do they do a source code
review?

25 A. Yeah.

35

1 Q. Yeah, and after they do the source code review,
2 they come up with a hash number; is that correct?

3 MR. DENKER: Objection to form, foundation.

4 A. I'm not aware of that.

5 Q. (By Mr. Risner) Well, you do know what a hash
6 code is, don't you?

7 A. I do.

8 Q. Yeah. And are you aware that various computer
9 election programs have, like, a library somewhere
where

10 there's a number of what the hash codes are that are
11 actually publicly available?

12 A. The NSRL library?

13 Q. Yeah.

14 A. Yes.

bad 15 Q. So, I'm sorry, what was -- I may have asked a
16 question before, but don't the ITAs, after they look
at 17 the source code, develop a hash number or hash code
for 18 it?

19 A. I'm not aware of that, if they do.

20 Q. Yeah, how does that number get into that
library?

21 MR. DENKER: Objection, form, foundation.

22 A. I'm not sure what the NIS procedures are for
23 submission of the hash code.

hash 24 Q. (By Mr. Risner) So you don't know how those
25 codes get there?

36

1 A. I do -- I do not know.

2 Q. And what's your understanding of the purpose of
3 what those hash codes are?

4 A. Hash codes are to be used to validate the
5 validity of the software that's referenced in the
6 library.

7 Q. And then are there any hash codes for the
8 database?

9 MR. DENKER: Objection, form, foundation.

10 Q. (By Mr. Risner) I mean, there can't be hash
11 codes for database elements, can there?

12 MR. DENKER: Objection, form, foundation.

13 Q. (By Mr. Risner) Or can there?

14 A. Well, of course there can.

15 Q. Huh?

16 A. Of course.

17 Q. Did the ITAs develop any -- something for the
18 database?

19 A. Not that I'm aware of.

20 Q. The SQL elements, you said those are
interpreted
21 code, right?

22 A. SQL is an interpreted language.

23 Q. Can it be modified at the county level?

24 MR. DENKER: Object to form and foundation.

25 A. I'm not aware of how that could be done.

37

the 1 Q. (By Mr. Risner) Is there anyone anywhere in
2 system that's checking to see if it's been changed at
3 the county level?

4 MR. DENKER: Objection, form, foundation.

5 A. I'm not aware.

6 Q. (By Mr. Risner) And I think you said what the
7 SQL is involved with is report generation.

8 A. Yes.

9 Q. All right. Anything else?

10 A. Not that I'm aware of.

11 Q. And that's not a core vote counting function,
12 correct?

13 A. Report generation would not be a core vote
14 counting function.

15 Q. So, the SQL just has some role in organizing
the 16 data; is that correct?

17 MR. DENKER: Objection, form, foundation.

18 A. I don't know what you mean by "organizing the
19 data".

20 Q. (By Mr. Risner) The report generation just
21 reorganizes data and presents it for viewing, isn't
that 22 correct?

23 A. That's incomplete.

24 Q. Okay. Complete it for me. Explain why it's
25 incomplete.

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1 A. It presents data for report generation.

2 Q. Yeah. Okay. Viewing or printing?

3 A. It may be viewed, may be printed, may be
written
4 to a file.

5 Q. And couldn't that be done by the same SQL that
6 resides inside GEMS?

7 MR. DENKER: Objection, form, foundation.

8 A. That's speculation. I don't know.

9 Q. (By Mr. Risner) Okay. So, I guess, do you
10 actually know whether it's functional or just a
residual
11 or byproduct of GEMS?

12 MR. DENKER: Objection, form, foundation.

13 A. It is functional.

14 Q. (By Mr. Risner) How do you know that?

15 A. In reviewing the code, reviewing the SQL
16 statements, the operations that are implied within
those
17 statements are necessary for the production of
reports.

18 Q. Well, but, okay, let me see if I'm following
you
19 here. You said the SQL that's in the database is
20 necessary for the production of reports.

21 A. That's correct.

22 Q. Yeah, but isn't there similar SQL in GEMS
itself?

23 Do you know?

24 A. I do not know.

25 Q. Could it be there?

39

1 MR. DENKER: Objection, form, foundation.

2 A. Are you asking me if it's possible? I would
have

3 to review the source code to make that determination.

4 Q. (By Mr. Risner) Okay. So I guess what I'm --
if

5 you don't know whether it's in GEMS, how do you know

6 that it's using the SQL in the database as opposed to

7 SQL in GEMS?

8 A. I'm not sure I follow your question. Can you

9 reask it?

10 Q. Yeah. If I understand you, you don't know

11 whether GEMS itself has SQL in it.

12 A. That's correct.

13 Q. And you don't know whether, in generating

14 reports, GEMS actually uses the SQL that's inside GEMS

15 to do that, correct?

16 A. That's not correct.

17 Q. No, okay. Why not?

18 A. GEMS is the overall envelope that is required
to

19 run an election, that in order for that election to be
20 properly processed, it must use the SQL code that's in
21 the database.

22 Q. Why must it?

23 A. Because the reports that are produced are an
24 essential part of the election report.

25 Q. Yeah, but you don't know whether GEMS itself
has

40

1 SQL that would generate those reports, correct?

2 A. I do not know if the GEMS -- and I'm assuming
3 that you mean the GEMS executable?

4 Q. Yeah.

5 A. I do not know that the GEMS executable has an
SQL
6 interpreter.

7 Q. In Georgia, just to clear up a little
something,
8 it's not terribly important for this case, but didn't
--

9 wasn't Diebold hired to pretty much run the election
10 there in Georgia in 2004?

11 MR. DENKER: Objection, form, foundation.

12 A. Not that I'm aware of.

13 Q. (By Mr. Risner) When was that election where
Max

14 Cleland lost? What year was that?

15 A. I believe that was the fall of 2002 election.

16 Q. Okay. And wasn't Diebold paid, you know, 54
17 million bucks, or some huge number, to help run that
18 election?

19 MR. DENKER: Objection, form, foundation.

20 A. Diebold had a contract with the State for
21 delivery of 19,000 DRE units, 400 optical scan units,
22 6,500 encoders.

23 Q. (By Mr. Risner) And then they --

24 A. But I'm not sure I know what you mean by "run"
an
25 election.

41

1 Q. Well, didn't they send a lot of their technical
2 people in to help set up those machines and be
involved

3 directly in the election?

4 MR. DENKER: Objection, form, foundation.

5 A. They provided technicians to each county for
6 election day support.

7 Q. (By Mr. Risner) Yeah. You know, a few months
8 ago, I was reading an article in, what is it, Rolling
9 Stone, that Robert Kennedy wrote. You're smiling.

10 You've read that article, haven't you?

11 A. No, I'm smiling that you read Rolling Stone.

12 Q. Well, I have a very broad range of intellectual
13 interests. Are you familiar with the article?

14 A. I am not.

15 Q. There was a -- I forget the guy's name now, but
16 there was a Diebold technician in Georgia that talked
17 about, you know, the Diebold president flying in with

a

18 little patch that he asked them to insert on the
19 machines and not tell any of the election officials
20 about it. Are you aware of those allegations?

21 A. I have not heard that one.

22 Q. Really?

23 A. Um-hum.

24 Q. Huh. And he said that he put them on, like,
25 1,500 machines, and they were installed on like 5,000

42

1 machines in heavy Democratic areas. You've not heard
2 anything about that?

3 MR. DENKER: Objection, form, foundation.

4 A. You're telling me new data on -- on an old
story.

5 Q. (By Mr. Risner) Yeah. You've not heard about

6 Diebold coming in with a patch, putting it on
thousands

7 of machines, and telling their employees not to let
any

8 election officials know anything about it?

9 MR. DENKER: Objection, form, foundation.

10 Q. (By Mr. Risner) That's a new story to you?

11 MR. DENKER: Form, foundation.

12 A. The version that you're telling me is a new
13 story.

14 Q. (By Mr. Risner) Yeah, which version have you
15 heard?

16 A. The allegations that a patch was applied to the
17 system, I'm familiar with that.

18 Q. Yeah. Well, what's your understanding of what
19 that patch was about?

20 MR. DENKER: Objection, form, foundation.

21 A. The -- I would have to review the
documentation.

22 As I recall, it dealt with an open port on the
23 configuration of Windows CE.

24 Q. (By Mr. Risner) So, what was the point of the
25 patch?

1 A. During the --

2 MR. DENKER: Objection, form, foundation.

3 A. During the acceptance testing of the units, the
4 units would sometimes freeze up during the testing.

5 Q. (By Mr. Risner) So, this was a patch that you
6 all were aware about and looked at, correct?

7 MR. DENKER: Objection, form, foundation.

8 A. That's correct.

9 Q. (By Mr. Risner) And that related to possible
10 problems with screen freezes?

11 A. Fixing the screen freeze, yes.

12 Q. Yeah. This employee of Diebold said that the
13 patch he was told related to a clock problem. So that
14 would be a patch that you weren't aware of, correct?

15 A. I'm not aware of a discussion of a patch
dealing
16 with a clock.

17 Q. Yeah. So the -- kind of interesting. You're
18 familiar with Rolling Stone magazine?

19 A. Um-hum, I read it.

20 Q. Yeah. Robert Kennedy, Junior, you know who he
21 is?

22 A. Um-hum. Um-hum.

23 Q. So, he writes an article in Rolling Stone and
24 quotes a Diebold technician who worked in that
election,

25 who personally involved -- installed 1,500 patches and

44

like

about

1 said that his buddies, together, the group, put in
2 5,000 of these patches and were instructed not to tell
3 the Georgia election officials about it. This thing
4 appears in a national magazine, and you don't know
5 it, that article. Is that what you're telling me?

6 MR. DENKER: Objection, form and foundation.

7 A. That is correct.

8 Q. (By Mr. Risner) I'll see if I can get you a
9 copy. It seems like it would be something right down
10 your alley.

11 Let me ask you about some studies of
12 vulnerabilities of these various systems. You've
read,

13 I take it, the Princeton University Security Analysis
of
14 the Diebold Accuvote TS System of September 13, 2006?

15 A. Yes, I have.

16 Q. How about the Johns Hopkins University Analysis
17 of Voting Systems in February 2004?

18 A. I am.

19 Q. And the California Secretary of State staff

20 report, Investigations of Diebold Election Systems, in
21 April 2004?

22 A. I have not read that --

23 Q. Huh?

24 A. I have not read that report.

25 Q. How about the Ohio Secretary of State DLE

45

1 Technical Security Assessment report of November 2003?
2 A. I'm aware of it, but I have not read the
report.

3 Q. Are you -- Maryland Legislative Services
Trusted

4 Agent report of January 2004, and Robert Technology
5 Report?

6 A. I've read that.

7 Q. The SAIC Risk Assessment report?

8 A. I have not read that one.

9 Q. The University of California Security Analysis
of

10 Diebold AccuBasic Interpreter report of 2006?

11 A. I don't recall reading it.

12 Q. Have you read the recent reports that the
13 California Secretary of State published, such as
Source

14 Code Review of the Diebold Voting System?

15 A. I have.

16 Q. The Ohio evaluation report from the 2006
17 election, have you read that?

18 A. I can't recall.

19 Q. Okay. How about Candice Hoke, GEMS Database
20 Design Issues Related to Voting System Certification
21 Standards, have you read that?

22 A. I can't recall.

23 Q. Well, you know Candice Hoke, of course, don't
24 you?

25 A. I don't know.

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1 Q. You don't?

2 A. I do not.

3 MR. DENKER: Objection.

4 Q. (By Mr. Risner) Oh, okay. I thought she was
at
5 one of these hearings in Ohio when you were there, so
I
6 thought you might know her from that.

7 A. (No oral response.)

8 Q. So what's -- do you have an opinion on the sort
9 of security design of the Diebold software of GEMS?

10 A. Uhm -- yeah, I do have an opinion.

11 Q. Yeah, what is it?

12 A. Needs improvement, but is on par with
competitive

13 products.

14 Q. So, in other words, would you say that they all
15 have pretty lousy security design?

16 MR. DENKER: Objection, form, foundation.

17 A. No, I didn't say that.

18 Q. (By Mr. Risner) No. I'm asking if you would
say
19 that.

20 A. No. I would say they -- they could all bear
21 improvement.

22 Q. Would you say that GEMS architecture conforms
to
23 fundamental database design principles and software
24 industry standards for ensuring accurate data?

25 A. I have -- I would not say that, but I would not

47

1 deny it either.

2 Q. Well, let's --

3 MR. DENKER: Let me have the record reflect
that

4 Mr. Risner is reading from a document.

5 MR. RISNER: The record can reflect that I used
a

6 document to formulate my question, and, in fact, the
7 document is called GEMS Tabulation Database Design
8 Issues in Relation to Voting Systems Certification
9 Standards.

10 Q. (By Mr. Risner) GEMS database can be edited
with 11 MS Access; isn't that correct?

12 A. That's correct.

13 Q. And would you agree that GEMS dependence on
14 Microsoft's JET technology introduces additional risk
to 15 data accuracy and security?

16 MR. DENKER: Objection, form, foundation.

17 A. In and of itself, no.

18 Q. (By Mr. Risner) Well, would you agree that,
you 19 know, in a computer environment, most security
problems 20 are caused by IT personnel?

21 MR. DENKER: Bill, I'm sorry, would you repeat
22 the question? I didn't hear it.

23 MR. RISNER: Well, maybe we can just read it
24 back.

25 (Pending question read by court reporter.)

1 MR. DENKER: Objection to form, foundation.

2 A. I'd have to -- I would not offer an opinion on
3 that. If you're asking do IT personnel pose a risk --

4 Q. (By Mr. Risner) Yeah.

5 A. -- then I would say yes.

6 Q. And why -- I'm trying to figure out what it was
7 you didn't like about my first question.

8 A. It's a very broad question. For example, if
9 you're talking about pay panel, the hackers represent
10 high -- more risk than the small number of IT
personnel
11 that support that system.

12 Q. Okay. Well, let's just then look at voting
13 computer systems. Wouldn't the greatest risk be from
14 insiders?

15 MR. DENKER: Objection, form, foundation.

16 A. Risk to what?

17 Q. (By Mr. Risner) Risk for rigging elections,
18 changing votes.

19 A. I -- I would agree that there is a risk posed
by
20 insiders. There's a risk posed by hackers. But I
would
21 not propose to stratify or quantify what that risk is.

22 Q. Well, why not?

23 A. Because there's many risks to the integrity of
an

24 election.

25 One of the concerns that many of us have is
that

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1 security is a red herring that is causing the neglect
of
2 some of the larger issues to the integrity of
elections.

3 Q. Like what? What's the larger issue?

4 A. Ensuring that voters are assigned to the proper
5 precincts.

6 Q. How would -- how could an outsider hack into
Pima
7 County's computer system?

8 A. I've not done an analysis on Pima County's
9 system --

10 Q. Okay.

11 A. -- to answer that question.

12 Q. In Georgia, are your Diebold systems cut off
from
13 the Internet access?

14 A. They are connected to no external network,
which
15 would include the Internet.

16 Q. So, you toured the Pima County facilities --

17 A. Yes.

18 Q. -- but you didn't learn enough to have any view
19 on how someone could hack into the system?

20 A. That's correct.

21 Q. Okay. So, let's assume that that computer is
not
22 connected to any other computers, it's not in a
network,
23 and it's not on the Internet, and that there are no
24 Wi-Fis and no entry by modem.

25 A. Um-hum.

50

1 Q. How could someone on the outside hack into that
2 computer?

3 A. I don't know.

4 Q. Now let's assume that you've got one or two or
a
5 couple of people that are on the inside that are
working
6 on that computer and have access to it, then they can
7 make changes, can they not?

8 A. I've not reviewed the security procedures of
Pima
9 County to know whether those changes could be made or,
10 if made, whether or not they would be detectable.

11 Q. Well, that's fine. Let's assume that you've
not

12 looked at Pima County's particular security, but let's
13 just invent County X, a mythical county --

14 A. Um-hum.

15 Q. -- that has a set-up where the computer's not
16 connected to another computer, not networked, no
modems,
17 no Wi-Fi. Then what would that County X do to see if
18 their inside computer operator had made changes?

19 MR. DENKER: Object to form, foundation.

20 A. I would have to know the existing controls in
21 that hypothetical environment that you described in
22 order to know whether that's possible or, if possible,
23 how probable.

24 It's very difficult -- I mean, if you're
saying,
25 hypothetically, can anything happen, I think, by

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1 definition, hypothetically, anything can happen.

2 Q. (By Mr. Risner) Well, what I'm trying to get
at
3 is what kind of controls would be needed to catch
these
4 insiders.

5 MR. DENKER: Object to form and foundation.

6 A. Well, I think the standard protocol include

7 supervision, logs, independent review.

8 Q. (By Mr. Risner) Who conducts the independent
9 review?

10 MR. DENKER: Objection, form, foundation.

11 A. Are you asking who can?

12 Q. (By Mr. Risner) Yeah.

13 A. Whoever the jurisdiction names as most
14 appropriate.

15 Q. And logs, what do you mean by "logs"?

16 A. Logs, access logs to the facility, access logs
to

17 the server, access logs to the software.

18 Q. And by "supervision," what do you mean?

19 A. Good business practices, that employees are
20 properly trained and properly supervised.

21 Q. What do you -- if, you know, everyone is using
22 the same user name, then that would defeat the log
23 functions, wouldn't it?

24 A. It would certainly compromise log functions.

25 Q. What if the inside person running the computer

52

1 took home with him a backup copy of the database at
2 night, would you see any security problems with that?

3 MR. DENKER: Object to form and foundation.

4 A. I would have to first look at what the
5 jurisdiction rules are on the custody of that data.

6 Q. (By Mr. Risner) I didn't ask you whether it
7 broke any rules. I'm asking you if you see any
security
8 problems with a guy taking home with him a copy of the
9 database.

10 A. On the surface, it would raise questions,
11 clearly.

12 Q. Yeah. Why's that?

13 A. It would raise the question of what are the
rules
14 of custody in that jurisdiction.

15 Q. Would it raise any question of what he did with
16 it at home?

17 A. It could.

18 Q. And if he had Access at home on his computer,
he
19 could just insert a CD and make any changes he wanted,
20 couldn't he?

21 MR. DENKER: Object, form, foundation.

22 A. That's an assertion. I don't know that that's
23 true or not.

24 Q. (By Mr. Risner) Well, what changes can you
make
25 with MS Access on your home computer to a database?

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1 A. And have it still function within GEMS?

2 Q. Yeah.

3 A. I don't know.

4 Q. Well, do any of those reports that you're
5 familiar with, do they talk about what can be done or
6 not done?

7 MR. DENKER: Objection, form, foundation.

8 A. The reports talk extensively about theoretical
9 scenarios.

10 Q. (By Mr. Risner) Uh-huh. Have you ever studied
a GEMS database in MS Access, yourself?

12 A. I have.

13 Q. Were you able to see if you could manipulate,
14 change things and do stuff to the database?

15 A. I did not attempt to manipulate any of the
data.

16 Q. Yeah. Do you understand that you could -- if
you did do that, you could just go in and erase on the log
17 what your activities had been?
18

19 MR. DENKER: Objection, form, foundation.

20 A. On which log?

21 Q. (By Mr. Risner) On the GEMS audit log.

22 A. And it be undetectable?

23 Q. Right.

24 A. I'm not aware of that.

25 Q. Are you aware that the GEMS audit log is part
of

54

1 the database itself?

2 A. Yes.

3 Q. Okay. So if you deleted what your activity
was,

4 then how would you be able to detect what had
occurred?

5 A. File size would have changed, the file date
size

6 would have changed, the file time stamp would have
7 changed.

8 Q. So, those are the kinds of things that one
would

9 need to examine to determine if there had been
10 manipulation of the database utilizing MS Access,
11 correct?

12 A. That would be among the evidence you would look
13 at.

14 Q. I think you said you saw the source code review
15 of the Diebold voting system?

16 A. Which report?

17 Q. The California one. (Hands document to
witness.)

18 A. I'm aware of it, but I am not familiar with its
19 contents. This was one done at Berkeley, I believe.

20 Q. Right, University of California Berkeley, under
21 contract with the California Secretary of State. It's
22 the Diebold Source Code Review.

23 And they -- one of their -- in the executive
24 summary, it says: The Diebold system lacks adequate
25 controls to ensure that county workers with access to

55

1 the GEMS central election management system do not
2 exceed their authority.

3 Do you agree with that or have any opinion on
4 that?

5 A. Do I agree with an assertion --

6 Q. Yeah.

7 A. -- that an employee should not exceed their
8 authority in the execution of their duties?

9 Q. No.

10 A. Restate.

11 Q. It's not a question of whether they should.

12 A. I'm sorry. Restate the question.

13 Q. What they're saying is that the Diebold system
14 lacks adequate controls to ensure that county workers
15 with access to the GEMS central election management
16 system do not exceed their authority.

17 They further state: Anyone with access to a
18 county GEMS server could tamper with ballot
definitions
19 or election results and could also introduce malicious
20 software into the GEMS server itself or into the
21 county's voting machines.

22 So, is this news to you, or do you -- or does
23 that conform with your understanding of GEMS?

24 MR. DENKER: Object to the form and foundation.

25 A. The assertion that the software itself lacks

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1 controls over employee access, is that --

2 Q. (By Mr. Risner) Here, let me just -- you can
3 just read it there.

4 A. Read the highlighted portion?

5 Q. Yeah, just read -- really read that. That's
what
6 I was asking you about. Want to read it out loud?

7 A. Certainly.

8 Vulnerability to malicious insiders. The

Diebold

9 system lacks adequate controls to ensure that county
10 workers with access to the GEMS central election
11 management system do not exceed their authority.

12 Q. You can read the rest of that next sentence,
too.

13 A. Anyone with access to a county's GEMS server
14 could tamper with ballot definitions or election
results
15 and could also introduce malicious software into the
16 GEMS server itself or into the county's voting
machines.

17 Do I agree with that?

18 Q. Yeah.

19 A. It's an incomplete sentence, so I will say I do
20 not agree with it, because what is implied there is
21 undetected.

22 Q. How can it be detected?

23 A. Well, that's what the jurisdiction's rules and
24 procedures are for. So, to assert that GEMS allows
25 employees to exceed their authority without knowing
what

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I 1 authority has the jurisdiction given those employees,
2 don't know how you can assert that a software

3 environment allows that access. What is the authority
4 of those employees?

5 Q. What do you mean by "authority"?

6 A. Well, that's exactly my question. What --
you're

7 citing that report. It says that the employees can
8 exceed their authority. What is that authority?

9 Q. Well, can we assume that they don't have the
10 authority to introduce malicious software?

11 A. Yeah, you can assume anything you like, I
guess,
12 as long as we're making assumptions, but that specific
13 statement says that it lacks the controls that would
14 prevent employees from exceeding their authority. My
15 question is: What is their authority?

16 Q. Yeah, but wouldn't you agree that nowhere in
the
17 United States would a county worker have authority to
18 introduce malicious software into GEMS?

19 A. I would agree with that.

20 Q. Yeah. And would you agree that they don't have
21 the authority to tamper with ballot definitions or
22 election results?

23 MR. DENKER: Object to form and foundation.

24 A. I would not agree with that.

25 Q. (By Mr. Risner) Yeah. Well, let's break that

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1 out. Do any county workers have authority to tamper
2 with election results?

3 A. What do you mean by "tamper"?

4 Q. Well, I think, "tamper," the way that I
5 understand that word, would be to change in an
6 inaccurate way.

7 A. Then I would agree with it.

8 Q. Yeah. Is "tamper" a part of your vocabulary?
9 How do you use the word?

10 A. If you're saying that "tamper" always has a
11 detrimental definition, then it does. You can tamper

--

12 for example, if you're talking about in reconciling
13 accounts --

14 Q. Yeah.

15 A. -- then GEMS has to be able to account for
every

16 valid ballot, regardless of how it is cast. So, when
we

17 have a, for example, a failure on a piece of equipment
18 in a jurisdiction, say one optical scanner in the
19 jurisdiction, if those ballots for some reason had to
be

20 hand counted, you still have to enter those totals
into

21 the vote totals. Is that tampering with the election
22 results?

23 Q. You consider that to be tampering?

24 A. I don't.

25 Q. Me either.

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1 A. Okay. Then we agree.

2 Q. Well, that would be like rectifying or some
other
3 word.

4 A. And that's why I asked for the clarification,
5 what do you mean by tampering. The ability to enter
in
6 election totals in the GEMS is a required part of that
7 system.

8 Q. Yeah. Well, can you think of any examples
where
9 tampering isn't doing something that's improper?

10 A. I can't.

11 Q. Well, how about tampering with valid ballot
12 definitions, would that be appropriate for any county
13 worker anywhere?

14 A. Election databases are modified with each
15 election.

16 Q. Yeah.

17 A. So the ballot definitions off of a database
will
18 be changed with each election.

19 Q. Right. And once it's changed and set, later on
20 that wouldn't be tampering, when they create the
ballot
21 definition, is it?

22 A. I would not consider it to be tampering.

23 Q. Yeah, tampering would be after that's done,
24 right?

25 A. Well, I don't -- I don't know what the legal

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1 definition of tampering is, but I thought that it said
2 change ballot definitions.

3 Q. No. It says, could tamper with ballot
4 definitions.

5 A. Okay. Yeah.

6 Q. Yeah. So, nobody would have authority to do
7 that, right?

8 A. I would think not.

9 Q. Yeah, okay. So on each of these points, we
agree
10 that no one anywhere could have authority to do it.

11 So, what they're saying is that the Diebold

12 system lacks adequate controls to ensure that the
county
13 workers with access to the GEMS central election
14 management system do not exceed their authority.

15 So, do you agree with that, or do you think
that
16 the GEMS system does have adequate controls to ensure
17 that these county workers don't do that?

18 A. Well, I'm not sure it's the responsibility, the
19 exclusive responsibility of GEMS to provide all the
20 controls for that environment.

21 Q. Okay.

22 A. For example, GEMS does not provide the server
23 log-in controls. That's an operating system function.
24 So you could criticize and say that GEMS does not
ensure
25 server log-in for its employees. It is not its

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1 responsibility.

2 Q. All right. So they say here that many of the
--
3 this is, again, University of California Source Code
4 Review.

5 A. Um-hum.

6 Q. And let me just ask you, are you aware of any

7 other source code review by academics of the Diebold
8 voting system?

9 MR. DENKER: Object to form and foundation.

10 A. I can't think of any off the top of my head.

11 Q. (By Mr. Risner) All right.

12 MR. DENKER: Are you going to admit that into
13 evidence, that report, as an exhibit?

14 MR. RISNER: No, no, it's -- it's way too thick
15 to do that, but you can go on the Internet and get a
16 copy. Just go to the California Secretary of State's
17 web site. In fact, you could probably pull one up
right
18 now, if you wanted to.

19 MR. MARCH: If they'd let me set up my Wi-Fi.

20 Q. (By Mr. Risner) It says here, many of the
21 vulnerabilities of the Diebold system result from deep
22 architectural flaws.

23 Do you think this Diebold system has deep
24 architectural flaws?

25 MR. DENKER: Object to the form and foundation.

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the
1 A. Yeah, I would not offer an expert opinion on
2 depth of those flaws.

3 Do I think it could be improved? Absolutely,
4 yes.

5 Q. (By Mr. Risner) Then they have kind of a
little
6 conclusion here. It says, again, I quote, this is
from
7 the executive summary, that: Due to these
shortcomings,
8 the security of the elections conducted with the
Diebold
9 system depends almost entirely on the effectiveness of
10 election procedures.

11 Do you agree with that?

12 A. I disagree.

13 Q. Yeah, okay. And in what way?

14 A. The phrase "almost entirely" is a sweeping
15 statement.

16 Q. Right.

17 A. I'm not sure I believe in anything almost
18 entirely.

19 Do I think that jurisdictions rely upon their
20 manual procedures to ensure integrity in their
21 elections? The answer's, absolutely, yes.

22 Q. You know, the sentence, security of elections
23 conducted with the Diebold system, they say "almost
24 entirely," you know, we could have said depends
25 entirely, and you wouldn't agree with that.

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1 A. Um-hum.

2 Q. So "almost entirely" is a little bit less.

3 A. Um-hum.

4 Q. How far down would you -- what word would you
5 choose?

6 A. Give me some more choices.

7 MR. DENKER: Objection, form, foundation.

8 A. "Somewhat".

9 Q. (By Mr. Risner) "Mostly"?

10 A. "Somewhat".

11 Q. And their conclusion was that the safest way to
12 repair the system is to re-engineer it so that it's
13 secure by design.

14 So, if I understood your questions earlier,
15 you're not aware of any way that, let's say, the
16 Democratic Party or a hacker could access Pima
County's
17 computer to insert any malicious code or hack into it?

18 MR. DENKER: Object to form, foundation.

19 A. I'm not aware.

20 Q. (By Mr. Risner) But you agree that insiders
21 could do that, because they have access to the
machine?

22 MR. DENKER: Objection, form, foundation.

23 A. Undetected, I do not think that to be possible.

24 Q. (By Mr. Risner) Okay. So how would they be
25 detected? That's --

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1 A. I would have to look at the jurisdiction's
2 controls that are in place for review of work product.
3 I would have to look at the intermediate controls on
4 product and process, where they're checked, before I
5 could answer how it could be detected.

6 Q. And who would do the detecting?

7 A. It would depend on the jurisdiction. Again, in
8 Pima County, the parties involved in L&A, for example,
9 they may be a part of the detection process. The
10 superintendent of elections, the registrar, could be a
11 number of people involved.

12 Q. So, is it your view, then, that the election
13 integrity and the verification has to remain in the
14 hands of the county election administrators?

15 A. That is purely a jurisdictional issue.

16 Q. Yeah. Well, let's assume that a political
party
17 wanted to verify and do the kind of examination

18 necessary to see if there had been some malicious
19 activity that had occurred. Do you see any harm in
20 that?

21 MR. DENKER: Objection, form, foundation.

22 A. Without knowing the details -- are they
23 qualified, what are they looking at, what's the time
24 lapse -- that would be difficult to give a blanket
25 approval or disapproval. But I would say that's up to

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1 the jurisdiction.

2 Q. (By Mr. Risner) In Georgia, your absentee
ballot
3 counts, how do they appear in your reports?

4 MR. DENKER: Objection, form, foundation.

5 A. Absentee ballots are considered a precinct, so
6 they're reported like every other precinct in the
7 jurisdiction.

8 Q. (By Mr. Risner) I'm not sure what you mean by
9 "considered a precinct."

10 A. Well, that's a reporting unit within GEMS,
report
11 votes by precinct, and although absentee ballots can
be
12 issued for every precinct within that jurisdiction,
they

13 are themselves considered a precinct. It's a
mechanism

14 for reporting.

15 Q. Okay. So, let's say your Georgia county has
100 precincts. And you do number the precincts, I take
it.

16 A. The precincts have a code that designates the
17 precinct, yes.
18

19 Q. And people can, whatever, each of those hundred
20 precincts, some people will submit an absentee ballot,
21 correct?

22 A. They may, yes.

23 Q. Okay. And are those absentee ballot votes
24 reported by their original precinct?

25 A. The votes are not -- the votes are mapped to
the

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1 races, but not to the precinct, not to the base
precinct
2 of the vote.

3 Q. So, in that -- all hundred precincts in that
4 county, then you report the vote totals by race as if
5 the absentee ballots were all from one precinct?

6 A. That's correct.

7 Q. And those absentee ballots are paper ballots

that

8 are counted on the AccuBasic optical scan readers?

9 MR. DENKER: Objection, form, foundation.

10 Q. (By Mr. Risner) Accuvote.

11 A. That's correct.

12 Q. And what do you all do in Georgia to audit or
13 confirm the accuracy of that count?

14 A. The count of the number of ballots or the votes
15 in the races on the ballots?

16 Q. Votes and races.

17 A. Well, all equipment is checked during L&A.

18 Q. So, what percentage of your votes in Georgia,
19 more or less, are absentee?

20 A. I couldn't say.

21 Q. Yeah. What are the requirements to submit an
22 absentee ballot?

23 A. The voter has to apply for an absentee ballot
24 from the election superintendent of their county.

25 Q. That's what I'm kind of getting at. You know,
in

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you 1 Arizona, we used to say you wanted one because maybe

2 were going to be out of town or busy or had some
excuse,

3 and now we have this system, we call them early
ballots,
4 where anybody can ask for one. Do you all have kind
of

5 an excuse system, or can anybody just ask for one?

6 A. Those are two different criteria. We have a
7 period of early voting that precedes the election, and
8 during early voting, any voter can go in and vote in
9 person at the designated location in the county.

10 Q. That's where they go in and touch the screen?

11 A. That's correct.

12 Q. Yeah. So in the -- these absentee ballots are
13 mailed in or delivered?

14 A. Mailed.

15 Q. Okay. So, let's say, in our hypothetical,
since
16 you have no idea what percentage of votes these are in
17 the state, let's say, in this hypothetical county,
18 there's 1,000 absentee ballots that come in, and the
19 votes are assigned to different races. How do you
check
20 to see that they were counted right?

21 A. During L&A, all equipment is tested against
live
22 ballots for that race.

23 Q. Right. Yeah.

24 A. When the ballots are received into the county
and

25 verified, the external envelope is verified as being a

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are 1 registered voter in that jurisdiction. The ballots
2 opened at the -- at the opening of the polls and
3 scanned, and they check for completeness of runs. So,
4 if there's a thousand ballots, they check to make sure
5 that there are a thousand ballots processed, looking
for
6 ballots that may not process because they're torn or
for
7 whatever reason they won't scan. So, there is a total
8 on the number of ballots processed as to completeness.

9 And that's kind of a broad overview of how the
10 ballots are counted.

11 Q. But there's no audit to go back and see if the
12 machine really did it right?

13 A. Georgia does not require a hand audit of
ballots.

14 MR. DENKER: Can we take a break for a minute,
15 please?

16 MR. RISNER: Yeah.

17 (Break taken, 11:16 to 11:26 a.m..)

18 Q. (By Mr. Risner) Are you familiar with the term
19 "security by obscurity"?

20 A. I am.

21 Q. And what's -- what's that mean in the computer
22 world?

23 A. Well, I think the intent of that is that, by
24 revealing more about a system, you get more eyes
looking
25 at the system, and, ultimately, over a period of time,

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1 you improve the security of the system.

2 Q. Yeah.

3 MR. MARCH: If you do security by transparency.

4 MS. FRIAR: Let the record reflect that Mr.
March
5 made a comment.

6 Q. (By Mr. Risner) Well, I thought security by
7 obscurity meant that you tried to keep people from
8 knowing what was going on.

9 A. That's correct.

10 Q. And that was the security by obscurity
approach.

11 A. I'm sorry. I thought you meant what was the
12 argument against security by obscurity.

13 Q. Ah, okay. So, in this election environment,
you
14 think that's a good thing, having security by

obscurity?

15 A. Exclusively?

16 Q. Well, just what -- what's your view on how that
17 argument or philosophy fits into the election?

18 A. I think it's a wonderful academic argument,
19 laudable goals, but difficult to implement. For
20 example, should passwords not be obscured? Should
21 sensitive data not be obscured? Every organization
22 obscures data that they consider to be of security

risk.

23 Your Social Security number, I assume, is obscure, as
is
24 mine.

25 Q. Well, it's not as obscure as I'd like.

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1 A. Exactly.

2 Q. Are you familiar with Greg Hoff's law (ph), the
3 late 18th Century --

4 MR. DENKER: Objection, form, foundation.

5 A. I am not.

6 Q. (By Mr. Risner) Yeah, me either. Have you
seen
7 the inside of these R6s?

8 A. Yes.

9 MR. MARCH: R6 motherboard.

10 Q. (By Mr. Risner) What's the particular --
11 particularly this section, what's the --

12 A. What is this? May I ask?

13 MR. DENKER: Can we identify the object?

14 MR. RISNER: I believe that's an inside of the
15 RS6 --

16 MR. MARCH: Motherboard of the R6.

17 MR. DENKER: Let the record reflect that Mr.
18 Risner has handed the witness a circuit board,
19 approximately nine-by-twelve inches.

20 MR. RISNER: Yeah.

21 Q. (By Mr. Risner) Well, take a look at this
22 section here. Tell me if you know what that is.

23 MR. DENKER: Mr. Risner is pointing to a
portion
24 of the circuit board.

25 A. Jump switch settings.

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1 Q. (By Mr. Risner) And what are the different
2 choices there?

3 MR. DENKER: Object to form and foundation.

4 A. Are you asking me to read --

5 Q. (By Mr. Risner) Yeah.

6 A. -- what's on this?

7 Q. Yeah.

8 A. There's a table that reads: Boot area
9 configuration, JP2, JP3, JP8, SW2, SW4, boot, side/
side,
10 XXX, one/one, illegal, on/off/on, one/two, E-Pron,
11 off/on/off, two/one, external flash, EST flash,
12 off/on/off, two/two, flash.

13 Q. So, can that machine be set to -- to boot
14 differently --

15 MR. DENKER: Object to form and foundation.

16 Q. (By Mr. Risner) -- from different areas of
17 memory?

18 A. This -- I cannot attest that this is a
19 motherboard from an R6 device. So, are you asking me
20 if, in theory, whatever this is, can have an alternate
21 boot?

22 Q. Yeah.

23 A. I can't tell you that from looking at that
table.

24 Q. Okay. Do you know whether the R6 can be booted
25 from different parts of the memory? Are there
alternate

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1 boots in the R6?

2 A. I do not know.

3 Q. Would it be a security problem if the R6 could
be 4 changed to boot from different areas in memory?

5 MR. DENKER: Object to form, foundation.

6 A. I -- I can't answer that without some context.
7 If -- are you saying, if there's more than one method
of 8 starting the system, does that make it inherently less
9 secure?

10 Q. (By Mr. Risner) Yeah, if it -- if I'm getting
11 this right, it can -- there would be, let's say, a
12 normal boot-up sequence, correct?

13 A. Well, there is a standard boot sequence for the
14 R6.

15 Q. Yeah. If that could be changed, would there be
a 16 security implication in there?

17 MR. DENKER: Object to the form, foundation.

18 A. The security implication that would make it
19 perhaps more secure or perhaps less secure?

20 Q. (By Mr. Risner) No. What if it's loading
21 different code when you changed which part of the
memory 22 it boots from?

23 MR. DENKER: Same objection.

24 A. I can't answer that.

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25 Q. (By Mr. Risner) Okay. Well, you didn't know

1 that the machines -- or you don't know whether or not
2 R6s can be set to boot differently; is that right?

3 MR. DENKER: Object to the form and foundation.

4 A. I'm trying to recall some of the articles that
5 have been written, but I cannot recall whether they've
6 been able to successfully boot an R6 in election mode.

7 Q. (By Mr. Risner) Do you still work with Britt
8 Williams, or is he retired?

9 A. I still see Britt from time to time, and he's
10 still a part-time employee.

11 Q. Of the election center?

12 A. Of Kennesaw State University.

13 Q. Kennesaw, yeah.

14 In "security by transparency" models, do those
15 involve freely handing out passwords or encryption
16 processes?

17 MR. DENKER: Objection, form, foundation.

18 A. I don't know.

19 MR. RISNER: I think that's all the questions I
20 have.

21 MR. MARCH: He has one more, one more thing.

22 MR. RISNER: Oh.

23 Q. (By Mr. Risner) Do you believe the election
24 integrity has to be left in the hands of county
election
25 administrators, in other words, that we need to trust

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1 those officials?

2 MR. DENKER: Objection, form, foundation.

3 A. I believe each jurisdiction has its own laws,
4 rules and regs that specify who is responsible for
5 election integrity and that I'm required, as a
citizen,
6 to uphold the law.

7 Q. (By Mr. Risner) Do you think it would be a
good
8 idea to just leave a system where you trusted these
9 guys?

10 MR. DENKER: Objection to form, foundation.

11 A. Which guys?

12 Q. (By Mr. Risner) County election officials.

13 A. Trust blindly or --

14 Q. Yeah.

15 A. Well, of course not.

16 Q. I mean, there's kind of like a history in this

17 country of people trying to influence elections by
18 changing votes or rigging them one way or another,
isn't
19 there?

20 A. There have certainly been instances,
21 interestingly enough, all relegated to paper ballots,
22 but, yes.

23 Q. Are you aware of any instance in the United
24 States where outsiders tried to hack into a computer
25 election system?

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1 MR. DENKER: Objection to form, foundation.

2 A. Successfully, or merely made the attempt?

3 Q. (By Mr. Risner) Either way. I'll take it
either
4 way.

5 A. Do you consider manipulating the GEMS version
on
6 that laptop attempting to alter elections?

7 MR. MARCH: No, because we've never tried to
get
8 it back into --

9 MR. DENKER: Was Mr. March's outburst in the
10 record?

11 COURT REPORTER: Yes.

12 A. Then my answer's, no, I'm not aware of a case
13 where outsider's have attempted to hack into the
system.

14 Q. (By Mr. Risner) Just to -- I didn't quite
15 understand you, but was your implication: Because
16 someone has GEMS, that that is related to an attempt
to
17 hack into the system?

18 A. A licensed copy of GEMS or an illegal version
of
19 GEMS?

20 Q. Well, just either way, either way.

21 A. I -- I would not make that assumption.

22 Q. Yeah. Now, what's the importance of a license
to
23 have a copy of GEMS?

24 MR. DENKER: Object to form, foundation.

25 A. Are you asking what's the importance of
copyright

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1 and intellectual property licensing?

2 Q. (By Mr. Risner) Yeah, what's the importance of
3 having a licensed copy of GEMS?

4 MR. DENKER: Objection, form, foundation.

5 A. I think most people who subscribe to the ACM
Code

6 of Ethics, Association for Computer Machinery Code of
7 Ethics, acknowledge that using unlicensed copies of
8 software is unethical.

9 Q. (By Mr. Risner) Does GEMS license their
10 database?

11 A. Not that I'm aware of, but it is certainly
12 copyright protected. The structure of the databases
are
13 copyrightable.

14 Q. But the database itself is not something one
15 licenses, correct?

16 A. I would assume not.

17 Q. Can Fair Use Law apply?

18 MR. DENKER: Objection, form, foundation.

19 A. Well, is there a -- I'm not sure what you're
20 asking.

21 Q. (By Mr. Risner) Is there something called Fair
22 Use?

23 A. Are there Fair Use exceptions?

24 Q. Yes.

25 A. There are Fair Use exceptions to copyrights.

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1 Q. But in terms of your understanding, GEMS itself
2 is licensed, but the database is not, correct?

3 MR. DENKER: Objection, form, foundation.

4 A. I -- I do know that GEMS is a licensed software
5 product, and I'm unaware of any licensing requirement
on 6 any work products, any databases produced by GEMS.

7 MR. RISNER: Yeah. Okay. That's all I have.

8 MR. DENKER: All right. Let's take a break for
9 just a moment. Thank you.

10 (Break taken, 11:43 to 11:57 a.m..)

11 EXAMINATION

12 BY MR. DENKER:

13 Q. I just have a few follow-up questions here.

14 And I just want to make sure that we have this
on 15 the record and that I'm properly stating this. Merle,
16 did you say that one of your concerns in handing over
17 the elections database to outside private entities is
18 that they can determine certain elements of the
19 structure of the database?

20 A. That's correct.

21 Q. And when we talk about "database," database in
22 quotes, are we talking about the MDB files?

23 A. Yes, we are talking about the MDB files.

24 Q. And what is a GB file?

25 A. GBF file is a post process MDB file by GEMS
which

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1 is compressed into a write-only format. So,
essentially

2 the GBF file is a GEMS stored version of the MDB file.

3 Q. In your opinion -- I'm sorry. Did I interrupt
4 you?

5 A. No.

6 Q. Okay. Scratch that. Let me ask you a
different
7 question.

8 Can GEMS generate a ballot without the SQLs
that
9 reside in the MDB file?

10 A. GEMS requires the entire content of the MDB
file,
11 including the SQL queries, to produce the ballot.

12 Q. Can GEMS generate a report without the SQL
13 queries in the MDB file?

14 A. I'm not aware that they can.

15 Q. Can GEMS process an election without the SQL
16 queries in the MDB file?

17 A. It cannot.

18 Q. And I just want to clarify something from
19 earlier. When we were talking about hash codes, Mr.
20 Risner was asking a series of questions regarding hash

21 codes, can you get a hash total from the database?

22 A. You can.

23 Q. And is that hash total going to change as you
use
24 the database?

25 A. Any modification made to the file will result
in

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1 a different hash code produced by hashing the file.

2 Q. Do the answers that you gave to the last two
3 questions have anything to do with whether the MDB
file

4 is a computer program under the definition of

5 ARS 16-444?

6 A. I'm going to have to remember the last
question.

7 Q. Well, the first question was: Can you get a
hash

8 total of the -- of an MDB --

9 A. Yes.

10 Q. And the second question is: Is it going to
11 change --

12 A. The production of a hash total off of any file,
13 including an MDB file, is independent of the question
of

14 whether it's a computer program or not.

15 Q. Okay. That's exactly the question I was
asking.

16 One of the areas in which you've been asked to
17 render an opinion is the area of security of the Pima
18 County election system, in particular security in the
19 context of releasing the MDB file to the public.

20 Would it, in your opinion, constitute a breach
of
21 security if we were to make it possible for a private
22 party to generate a false set of election returns that
23 are forensically indistinguishable from the official
set
24 of election returns, would that be a security risk?

25 A. That would be an enormous security risk.

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1 Q. Do you have an opinion about, in general, the
2 trustworthiness of electronic voting, that is to say
--

3 let me define that a little better -- the use of DRE
4 systems in comparison with other election systems, for
5 example, paper ballots, punch card ballots, black and
6 white marbles?

7 A. DRE systems are more reliable in terms of
8 processing of information than any paper-based or
9 mechanical-based system.

10 software,

Q. In your opinion, can any software, user

11 be expected to provide all of the security for the
12 environment in which it's used?

13 A. No.

14 Q. Can it be expected to provide all the security
15 for the users or the results obtained from using the
16 software?

17 A. No.

18 Q. Are you familiar with the Brennan Center study?

19 A. I've read more than one Brennan Center report.

20 Q. Okay. I haven't, so I'm not sure how to
21 distinguish them for purposes of the question. So,
let
22 me ask you -- let me ask this question in a different
23 way. Is there a risk, a security risk, or could you
24 foresee a security risk, if a private party had the
25 ability to produce their own copies of the official

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1 ballot for an election prior to the election?

2 A. Yes. In Georgia, we have a code that requires
--

3 SOS code that requires that all ballots be -- all live
4 ballots be stamped as "sample" prior to an election.

5 Q. So, if I had the ability, at home or elsewhere,

if 6 outside the confines of the official election system,
of 7 I had the ability to produce copies, official copies
8 the ballot for an election, and multiple copies, would
9 that represent a security risk, in your opinion?

10 A. It would, especially in an optical scan
11 jurisdiction.

scan 12 Q. Do you consider Pima County to be an optical
13 jurisdiction?

14 A. I do.

15 MR. DENKER: I believe that's all I have.

16 EXAMINATION

17 BY MR. RISNER:

of 18 Q. Yeah, Mr. King, you responded that a false set
19 returns would be an enormous security risk. What are
20 you talking about?

could 21 A. A counterfeit set of election returns that
22 create confusion in the public's mind about which
23 constitute the official results of an election.

24 Q. Okay. What's a counterfeit set of election
25 returns?

1 A. An election report that's erroneous but mimics
2 the reports produced by the election management
system.

3 Q. I want to make sure I understand what you're
4 talking about. So, where would this report come from?
5 Where would that data come from?

6 MR. DENKER: Objection to form, foundation.

7 A. Are you asking where would the counterfeiters
8 acquire the information?

9 Q. (By Mr. Risner) Okay.

10 A. If they had access to the MDB files for a live
11 election --

12 Q. Yeah.

13 A. -- they could fabricate their own results,
embed
14 that into the system and present it as the results of
an
15 election.

16 Q. What do you mean "embed" it in the system?
17 What's that mean?

18 A. Embed it into the MDB tables, enter it into the
19 tables.

20 Q. I don't -- now I'm not following this. So how
21 would they -- how would they get this? We're talking
22 about, like us, say the Democratic Party --

23 A. Um-hum.

24 Q. -- if the county gave us a copy of their
election
25 database --

83

1 A. Um-hum.

2 Q. -- when the election's over, is that -- at what
3 point in time did you assume that the Democratic Party
4 would get a copy of the election database?

5 A. Well, I didn't assume that the Democratic Party
6 would get a copy of the election database. You asked
7 me --

8 Q. Well, did your answer assume --

9 A. Well, you asked me how could a counterfeit copy
10 of election results be produced.

11 Q. No. No. Your lawyer asked you a question,
12 right?

13 A. He's asked several questions, yes.

14 Q. Yeah. And he asked you one about this false
set
15 of returns.

16 A. Um-hum.

17 Q. What did you -- tell me what -- if you could
18 explain to me what he was asking so that I'll
understand

19 your answer a little better.

20 MR. DENKER: Objection to form, foundation.

21 Q. (By Mr. Risner) Yeah.

22 A. May we ask the reporter to read back the
23 question?

24 Q. Well, yes, you could --

25 A. Yes, please.

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1 Q. -- but I don't -- sure.

2 (Following read by court reporter: "Question:
3 Would it, in your opinion, constitute a breach of
4 security if we were to make it possible for a private
5 party to generate a false set of election returns that
6 are forensically indistinguishable from the official
7 of election returns, would that be a security risk?
8 Answer: That would be an enormous security risk.")

set

9 A. So, your question to me was: Why is that an
10 enormous security risk?

11 Q. No.

12 A. Oh.

asked

13 Q. This is an area where you said you've been
14 to render an opinion, right?

15 A. Correct.

16 Q. Okay. Now, if they released the -- what is it
17 that he was asking would be released to the public?
18 What's your understanding of what would be released to
19 the public?

20 A. The election database.

21 Q. Yeah. When? At what point in time?

22 A. He didn't specify.

23 Q. Does it matter to you?

24 A. Yes.

25 Q. Okay. So, in your opinion, you must have had,
in

85

1 your own mind, an idea of when in the process that
was,
2 since it mattered to your opinion.

3 A. Yes.

4 Q. Yeah. When did you think he was talking about?

5 A. I assumed during the election.

6 Q. Okay. And what does that mean, "during the
7 election"?

8 A. Before the election is certified by the
9 jurisdiction.

10 Q. Okay. And so if it's after the election is

11 certified by the jurisdiction, is your opinion
12 different?

13 A. Slightly different.

14 Q. How would it be different?

15 A. It goes from being an enormous security risk to
a high security risk.

16 Q. Okay. So, if it's after certification, why
would it be a high security risk?

17 A. I think that the revelation of the architecture
18 of the database, in and of itself, is a security risk,
19 because it reveals the organization of the data.
That's

20 a critical requisite piece for a hacker to begin to
21 mount a hack against an election.

22 Q. Okay. So you're saying it would be a high
23 security risk for the next election, not for that

86

1 election; is that correct?

2 A. It would be a high security risk for all
3 subsequent elections within and without Pima County.

It

4 would still be, I think, a potential security risk for
5 the current election, because what is the assumption

I'm 6 about the skill set of the recipients of the user --

7 sorry -- the recipients of that MDB file.

8 Q. Why would it be a security risk for the current
9 election after the election had been certified?

10 A. To create confusion on the part of the public's
11 mind about what are the official results of the
12 election.

in 13 Q. Are you aware of that ever happening anywhere
14 the United States of America?

15 A. Of what happening?

the 16 Q. Where someone got a copy of a database after
was. 17 election and sowed confusion as to what the outcome

18 A. I'm aware that people contest elections all the
19 time and dispute the counts of elections.

20 Q. Yeah.

file 21 A. Whether they have done so with the GEMS MDB
22 or not, I do not know.

can 23 Q. Well, of course, someone can. You know, they
24 have a recount or a specific challenge. But I thought
25 you said that someone would just be sowing confusion.

1 MR. DENKER: Object to form, foundation.

2 A. I said it could create confusion about the
3 official results of an election if the MDB file
released
4 to the public is used to produce counterfeit results.

5 Q. (By Mr. Risner) What would be the purpose of
6 someone producing counterfeit results?

7 A. I can't speculate on that.

8 Q. Well, why not? I mean, how can you have an
9 opinion about the security risk if you can't even
10 speculate on it?

11 A. Well, speculate on the motives of why people
12 would produce counterfeit results?

13 Q. Sure.

14 A. Why people commit election fraud?

15 Q. Election fraud maybe is a separate question.
I'm
16 asking about counterfeit results.

17 A. Well, I think counterfeit results would
certainly
18 fall under most jurisdictions' statute of election
19 fraud.

20 Q. Okay. Well, I don't understand this.

21 A. Why people commit election fraud?

22 Q. Merle, I don't understand what you're talking
23 about, so you really have to help me out here.

24 A. Okay.

25 Q. Let's say that Pima County gives the Democratic

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1 Party a copy of the database, you say after the
2 election's certified. Okay?

3 A. Um-hum.

4 Q. And let's assume they give it to the Republican
5 Party, because we believe all political parties get
it,
6 and the Libertarian party. Okay? And let's assume
that

7 one of these political parties decides to sow
confusion.

8 What would they do?

9 A. Are you asking me to speculate on what they
would
10 do?

11 Q. Sure. Heck, yes. It's your opinion that it's
a
12 high risk. Obviously you have some thoughts in this
13 matter.

14 A. Produce election reports using purloined copies
15 of GEMS that mimic official election results.

16 Q. Yes. Then what is going to happen? They'll
hold
17 a press conference?

18 A. Perhaps.

19 Q. Now, if it's before it's certified, same deal?

20 A. Well, I think the risk is perhaps greater at
that 21 point.

22 Q. Okay. Why?

23 A. In order to mount a successful hack on a live
of 24 election, the hacker would need to know the structure

25 the database. So putting that database into the wild,

89

1 while the election is still live, would be a
2 considerable risk.

3 Q. Which part of the structure would create the
4 risk?

5 MR. DENKER: Object to form, foundation.

6 A. My opinion would be that the entire structure
7 needs to be protected.

8 Q. (By Mr. Risner) Yeah, which part of the
9 structure would create the risk?

10 A. Not exclusively, but the user IDs and the
11 passwords.

12 Q. And how would a political party on the outside
13 get the hacked database back into the county's

computer?

14 MR. DENKER: Objection, form, foundation.

15 A. I can't speculate on that. That would either
be

16 their method of hacking the election or how they might
17 go about it.

18 Q. (By Mr. Risner) That's all the questions I
have.

19 Well, wait, wait.

20 MR. MARCH: Two things. Two items.

21 MR. RISNER: Hold on.

22 Q. (By Mr. Risner) Let me ask you this. Does
GEMS

23 use the SQL portion of the database to create ballot
24 layouts?

25 A. What do you mean by "ballot layout"?

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1 Q. Ballot format.

2 MR. MARCH: Definition.

3 Q. (By Mr. Risner) Definition.

4 A. Those are all three different things.

5 Q. Okay. Make it three different questions.

6 A. It uses the SQL to produce the ballot layout.

7 Q. Earlier I thought you said that the SQL was
used

8 for creating reports.

9 A. Displays, reports and displays.

10 Q. So, you think that GEMS uses the SQL in the
11 database also to create ballot layouts?

12 A. Layout is a display.

13 Q. Huh?

14 A. Layout is a display.

15 Q. What else is displayed that's created by SQLs
in
16 the database and not in GEMS itself?

17 A. Well --

18 MR. DENKER: Object to form, foundation.

19 A. -- I would have to look at the reports to give
20 you a list of what's generated.

21 Q. (By Mr. Risner) Have you talked to Diebold
22 personnel about what SQL does in the database?

23 A. I've had conversations with Diebold -- I'm
24 sorry -- Diebold, or now Premier, personnel on the
25 function of the queries and the tables in the GEMS

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1 database. I can't recall specific conversations about
2 the SQL.

3 Q. Are you relying on what they told you for any
of

4 your opinions in this case?

5 A. No.

6 Q. Are you relying on any written reports by
anyone

7 for your opinions in this case?

8 A. I'm not sure I understand your question. My
9 opinions are the culmination of reading a lot of
10 reports --

11 Q. Okay. But in terms of the --

12 A. -- including the Brennan report, the Berkeley
13 report, the SAIC report, the Robert report.

14 Q. Really what I'm thinking about is the SQL
queries

15 in the database. Is there any written report that
16 discusses that or its function?

17 A. Not that I can recall.

18 MR. RISNER: That's all I have.

19 EXAMINATION

20 BY MR. DENKER:

21 Q. I just wanted to clarify one -- one question
and

22 answer. And what I understood the question to be was,
23 how do they get it back into the county system, was

the
24 question that Mr. Risner had asked you. And you said
25 you can't speculate as to what their method would be.

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1 What was your understanding of what that
question

2 was and what was your answer to that?

3 A. Well, I understood counsel to ask me about a
4 specific technique for an intrusion, which was to take
5 the modified database back into the GEMS environment.
6 And one of the difficulties in dealing with hackers is
7 that their methods are constantly evolving, so it's
8 challenging to speculate on a specific strategy that
9 someone would use to hack an election.

10 Q. Okay. In that case, then, I do have another
11 question. Would there be a security risk associated
12 with a private party's ability to generate a false set
13 of election returns, even if they did not return it to
14 the county's election system computers?

15 A. I -- I'm struggling with an answer to that
16 question, because unless you know how the election
17 results are certified, it's difficult to know where
18 potential insertion points are for a bogus report in
19 that system.

20 Q. Okay.

21 A. So the insertion could come after it leaves a
22 server in a facility, and I think you'd have to look

at

23 the -- the spectrum of activities that surround the
24 tabulation and the reporting of results.

25 Q. Fair enough.

93

1 MR. DENKER: That's all I have.

2 EXAMINATION

3 BY MR. RISNER:

4 Q. I have a question. Are you aware of any hacker
5 strategy that does not require access to a computer?

6 A. Oh, yeah.

7 Q. Tell me about them.

8 A. There is some time-honored traditions of
fishing 9 through garbage cans to get data. Hacking does not
10 necessarily mean restricted to a computer system.
11 Hackers hack into information systems using mechanical
12 methods, social engineering.

13 Q. So, when you use the term "hacking" into a
14 computer, that includes going through garbage and
15 reading data?

16 A. Could.

17 Q. So, define "hacking into a computer" for me.
I'm 18 befuddled.

all 19 A. One of the reasons that most facilities shred
20 of their reports, or in some cases shred and burn on
21 site their reports, is that printed hard copies often
22 contain access code information, log-ins, et cetera.
on 23 So, the initial starting point for a hack may not be
24 a computer. It may be through social engineering,
phone 25 calls, site visits, et cetera.

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1 Q. What's "social engineering"?

2 A. Try to extract data from users through
3 manipulation, through telephone conversations,
4 face-to-face conversations, et cetera.

5 Q. Okay. So, let's assume that a very successful
6 social engineering went on, and some outsiders got the
7 password --

8 A. Um-hum.

9 Q. -- and went through the garbage. How are they
10 going to get whatever information they want into a
11 central computer?

12 MR. DENKER: Object to form, foundation.

13 A. What's the architecture of the computer?

14 Q. (By Mr. Risner) Well, the computer is not on

the

15 Internet, doesn't have Wi-Fi, is not part of a
network,

16 and is sitting in a rack with observable cables that
go

17 to it only --

18 A. Um-hum. Um-hum.

19 Q. -- in a locked room, with cameras on it. How
are

20 they going to get that into that computer?

21 A. I don't know.

22 Q. I'll accept that answer, sure. You can't think
23 of a way, can you?

24 A. No, I can think of a way, but you asked me how
25 would they do it. If you're asking me what are the

95

1 possible methods?

2 Q. Yeah. Sure. Tell me.

3 A. The unit goes out for repair.

4 Q. Ah, okay. Got anything else?

5 A. Well, that's an example.

6 Q. Yeah, that's one, yeah. Got a two or three?

7 A. Not off the top of my head.

8 Q. Okay. And if it goes out to repair, then that

9 gives someone the opportunity to physically access the

10 machine?

11 A. That's correct.

12 Q. Without physically accessing the machine, how
are
13 they going to do it?

14 A. Well, again, you have to know the continuity of
15 how the election results are reported. Those results
16 are not instantly certified in the GEMS server. So
17 those results have to somehow leave the GEMS server
18 before they're certified by the election
superintendent,
19 the county or the secretary of state, whoever is
20 responsible for certification.

21 So, what happens when it leaves that system
prior
22 to certification is also part of the vulnerability in
23 that system. Is it written to media? How is that
media
24 transported? Who transports the media? What's the
25 chain of custody for the media?

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1 Q. Sure. But then you can go back and re-create
it
2 by getting, you know, and checking the original
3 computer, correct?

23 WITNESS MY HAND THIS 17th day of November, 2007.

24

25

Mary Meyer, R.P.R., Certified Reporter 50225

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**UNITED STATES DISTRICT COURT FOR
THE NORTHERN DISTRICT OF GEORGIA
ATLANTA DIVISION**

CURLING, et al.

Plaintiffs,

VS.

BRAD RAFFENSPERGER, et al.

Defendants.

**CIVIL ACTION NO.:
1:17-cv-2989-AT**

SUPPLEMENTAL DECLARATION OF MATTHEW D. BERNHARD

MATTHEW D. BERNHARD declares, under penalty of perjury, pursuant to 28 U.S.C. § 1746, that the following is true and correct:

1. This declaration supplements my previous declaration of August 03, 2018 [Doc. 258-1 ¶¶ 33-42].
2. The opinions expressed at the time of the previous declaration continue to represent my opinions
3. To assess whether the inadequacies of Georgia's voting system have had an impact on election results, a good first step is to examine the accuracy of the data used by the system to configure the voting machines.
4. This data is stored in the GEMS database, and while there are numerous avenues by which data in the database may be corrupted prior to its entry into the database, once bad data is in the database, it has the potential to significantly impact the functionality of the rest of the voting system, including but not limited to the election management system, the electronic poll books, and the voting machines themselves. Examining the database is an useful step to determine whether the voting system has errors, bugs, or malicious code that may have had an impact upon election outcomes.

5. The detailed analysis of the GEMS database sought by the Coalition Plaintiffs is labor intensive clerical work: examining the data in the table for any inconsistencies (like candidate identifiers not matching or candidates not appearing in a race where they should). Potential mistakes can be flagged by analysts without extensive knowledge of computer science.

6. The fact that the GEMS database is not sensitive is reflected in the fact that it is distributed to every county in Georgia and accessed by thousands of poll workers across the state. All 159 counties have multiple copies of GEMS databases which appear to be accessible without restriction by election staff. Allowing the plaintiffs to examine the database creates no additional risk.

DATABASES AND MICROSOFT ACCESS

7. Databases are a well-studied and developed field of computer science, and nearly every computer application in existence has some interaction with a database. The most common kind of database is a relational database, where data is stored as a series of tables and entries that have some kind of relation with other similar pieces of data. Common relational database applications include SQL and Microsoft Access.

8. Because certain data types in the database can have arbitrary length, if a program is reading from the database and does not properly account for the length of the data, it may accidentally read so much data that it overwrites its own program. This is what is known as a *buffer overflow* (a *buffer* is where data is kept when it is being read out of a file or database). Overflows may occur due to incorrect lengths being specified in the database, improperly formatted character sequences, or simply data that is unexpectedly long. A clever attacker can craft data that, when the program reads the data in, results in a buffer overflow and overwrites the original program with code that the attacker wrote. This is a buffer overflow attack, or an exploitation of a buffer overflow, and it is one of the most common ways that hackers gain unauthorized access to systems.

9. Even though the data in the database is not treated as code that can be executed by a computer, if the data overwrites a piece of the program that is reading the data it will be executed by the computer as if it were part of the program. Even in the absence of malicious intent, a buffer overflow vulnerability can result in unexpected or undetected behavior by a program.

10. Another common threat vector for database programs (in particular Microsoft Access) is the use of macros, which are small programs that can be written inside the database program to assist in arduous or repetitive tasks. These macros, while powerful, also present a major security vulnerability to most database engines, as malicious macros can take over the database software and corrupt data.

11. However, even if macros are entirely disabled, if data in the database is not formatted in a way that the program reading it expects, it can still lead to a buffer overflow. Regardless of whether macros are enabled or not, data that exists in the database can still result in unexpected or malicious behavior to occur in the program that is reading the data.

THE GEMS DATABASE

12. The GEMS database contains all data used by the GEMS system to set up an election, program poll books and voting machines, and tabulate results. In many states, including Arizona, Colorado and California, the database is publicly available for scrutiny. In examples of the GEMS database which I have examined, from multiple jurisdictions using multiple versions of the GEMS software, no data contained in the database poses a privacy threat to voters or exploitation of the voting system by being disclosed. The structure of the database is disclosed in GEMS manuals that have been publicly available since the system was first put in service.¹

13. GEMS databases are Microsoft Access databases, and can be opened by any Microsoft Access program.

14. The tables in the GEMS database store a variety of information about an election (see **Exhibit TK**), including candidate names and party affiliation, jurisdictions, information about the voter access cards, ballot styles, how election results should be reported, precincts, polling locations, ballots layout, and so on. At the conclusion of the election, results are also written into the database, including how many votes were cast on each machine in each precinct, how many votes were cast for each candidate, the number of write-in votes, and so forth.

15. An error in the data entry into the GEMS database, such as switching the two identifiers for two candidates, could have an impact on the outcome of an election without being easily detected. Worse, if an error in the database causes a

¹ For an example, see : http://blackboxvoting.org/docs/diebold/GEMS_1.18_Users_Guide_Revision_12.pdf

buffer overflow, the error may not be reported in subsequent data reporting mechanisms by the GEMS system, like the system report PDFs that GEMS can generate. The only way to know if there is bad data in the database which might cause unexpected behavior when in use is to examine the database itself.

16. Example of other errors that a clerical review of the GEMS database may detect include:

- Mathematical errors in vote tallies and the formulas that generate them;
- Inaccurate inclusion or exclusion of precincts or voters permitted to vote on certain races;
- Switching candidate numbers causing the votes to be recorded for the wrong candidate;
- Failure to upload all voting machine memory cards containing votes on election night (a well-documented, frequent error);
- Discrepancies between poll tape reports and officially reported vote tallies;
- Identification of malfunctioning machines with anomalous results;
- Leaving a candidate or question off certain ballots in error.
- Failure to properly add all eligible provisional ballots.
- Odd data formatting that may induce unexpected behavior by various components of the voting system, including but not limited to GEMS and the voting machines. For example, if a precinct name was “pasted” into the table, the name may include control characters that the database engine or programs which use the database may not expect.

17. If the initial review of the GEMS database fails to identify any anomalies, this does not fully exonerate the system. However, it will provide much better footing with which to target the evaluation of other components of the system forensically, and would rule out the hypothesis that incorrect configuration is the cause of many of the anomalous behavior exhibited by Georgia’s voting system. As examining the GEMS database requires little technical expertise, does not require stringent security procedures, and the database can be easily produced by the defendants, its examination is the most efficient way to proceed in a forensic investigation of Georgia’s voting system and will provide a good basis for future forensic investigations requiring expertise of computer scientists.

GEMS DATABASE REPORTS

18. Some of the data contained within the GEMS database is also present in the reports generated by the GEMS software. Examples of the specific reports that the state has offered are shown in **Exhibits TK**, and include:

- Base Precincts with Race Report: an accounting of which races appeared on the ballot in each precinct;
- Vote Center with Cards Report: an accounting of which memory cards and ballot styles were present in each precinct;
- Statement of Votes Cast Report: Election results by precinct for every candidate on the ballot in each precinct;
- Summary Report: summarized election result including breakdowns by type of ballot cast (early voting, absentee by mail, and so on);
- Ballot Image Report: a text representation of every ballot recorded by the voting system during the election (one report for every ballot cast, i.e. millions of pages of data from just the November 2018 election alone).

19. These reports fail to provide crucial information contained in the GEMS database. Due to the potential vulnerabilities discussed above, and the fact that these reports are generated by the GEMS database itself, it is entirely possible that errors which reside in the database would not appear in these reports. For example, if a field in the database incidentally triggers a buffer overflow, this error may not appear in the written report.

20. These reports also do not contain all of the data in the GEMS database that is germane to an inquiry about configuration errors or malware. For example, nothing in the reports would show a miscoding of a candidate's name. Vote totals which were erroneously counted for Candidate A due to a misconfiguration, for example, would also appear that way in the reports. Essentially, the reports do not create an independent evidentiary trail with which to assess the correctness of the GEMS database, because they (a) do not contain all of the data in the database and (b) will not exhibit errors in a detectable way.

21. Not only do these reports not constitute a faithful recreation of the GEMS database, but they create a significant burden on the investigation. The database is fully searchable and can be examined using standard database tools. GEMS reports are PDFs, which would preclude the usage of tools that could facilitate easy comparison and validation of entries. Examining and testing tabulations on millions of pages of ballots image reports alone would take far more time than a full forensic investigation of the entire GEMS server.

22. I understand that the State Defendants contends that the integrity of the GEMS Database, and other aspects of Georgia's system, is confirmed by using what is called "hash" comparisons between the suspect program and a known uncompromised version. The only thing such hash comparisons can establish is whether or not two copies of a file are identical. The kinds of errors that Plaintiffs seek to investigate by reviewing the GEMS database are likely to occur in all copies of a particular database file. Therefore, hash comparisons can in no way substitute for a detailed review of the database contents.

This 1st day of July, 2019.

A handwritten signature in blue ink, appearing to read "Matthew D. Bernhard", written over a horizontal line.

Matthew D. Bernhard

CounterGroup

6/26/2019

KeyId	Label	ShortLabel	SortSeq	VGroup1Id	VGroup2Id
0	Polling	POLL	10	0	0
1	Early	EARLY	20	0	0
2	Provisional	PROV	30	0	0

CounterGroup

6/26/2019

PerCards	ExportId	UseArtworkPctl	UseArtworkCGr
100		1	0
100		1	0
100		1	0

Candidate

6/26/2019

KeyId	Label	SortSeq	CandidateType	ExportId
9	KIRKPATRICK, A	10	0	
10	CARMONA, RIC	10	0	
35	CAJERO BEDFO	10	0	
41	PANCRAZI, LYN	10	0	
47	FARLEY, STEVE	10	0	
53	BRADLEY, DAVI	10	0	
67	FLEMING, PAT	10	0	
90	DALESSANDRO,	10	0	
91	GABALDÓN, R	20	0	
150	LEACH, ROBER	10	0	
151	STONEBRAKER,	20	0	
179	BARBER, RON	10	0	
188	GRIJALVA, RAÚ	10	0	
195	LOPEZ, LINDA	10	0	
203	HOLT, JO	10	0	
210	GONZALES, SAL	10	0	
211	SALDATE, MAC	20	0	
220	SIDHWA, MOH	10	0	
221	STEELE, VICTO	20	0	
224	MACH, STEFAN	10	0	
226	WHEELER, BRU	20	0	
233	JOSEPH, DAVE	10	0	
244	BUSCHING, MA	10	0	
245	KENNEDY, SAN	20	0	
246	NEWMAN, PAU	30	0	
256	YOUNG WRIGH	10	0	
265	VALADEZ, RAM	10	0	
271	BRONSON, SHA	10	0	
283	ELIAS, RICHA	10	0	
289	LAWALL, BARB	10	0	
295	DUPNIK, CLARE	10	0	
306	RODRIGUEZ, F.	10	0	
312	RICHARDSON,	10	0	
318	STAPLES, BILL	10	0	
328	CASTILLO JR., J	10	0	
329	Write-in 20	20	1	
333	DOLNY, CARME	10	0	
334	Write-in 20	20	1	
338	SIMON, PAUL	10	0	
339	Write-in 20	20	1	
343	FELIX, MARIA L.	10	0	
344	Write-in 20	20	1	

Candidate

6/26/2019

KeyId	Label	SortSeq	CandidateType	ExportId
353	RADEMAKER, J	10	0	
359	DRISCOLL, JIM	10	0	
365	BERNAL, BENN	10	0	
375	DORGAN, MAR	10	0	
376	Write-in 20	20	1	
380	PHILIP, COLETT	10	0	
447	Write-in 20	20	1	
452	YES	10	0	
453	NO	20	0	
454	YES	10	0	
455	NO	20	0	
456	YES	10	0	
457	NO	20	0	
458	YES	10	0	
459	NO	20	0	
460	YES	10	0	
461	NO	20	0	
462	FLAKE, JEFF	20	0	
464	PATON, JONAT	20	0	
466	MCSALLY, MAR	20	0	
468	SAUCEDO MER	20	0	
469	GUERRA, BLAN	30	0	
470	Write-in 40	40	1	
471	Write-in 30	30	1	
473	MOTT, TYLER	20	0	
474	Write-in 30	30	1	
475	ANTENORI, FRA	20	0	
476	Write-in 30	30	1	
477	MELVIN, AL	20	0	
478	Write-in 30	30	1	
479	GRIFFIN, GAIL	20	0	
480	Write-in 30	30	1	
481	ACKERLEY, JOH	30	0	
482	Write-in 40	40	1	
483	Write-in 30	30	1	
485	ORR, ETHAN	30	0	
486	Write-in 40	40	1	
488	Write-in 40	40	1	
489	Write-in 50	50	1	
490	CLODFELTER, T	30	0	
491	VOGT, TED	40	0	
492	Write-in 50	50	1	

Candidate

6/26/2019

KeyId	Label	SortSeq	CandidateType	ExportId
493	Write-in 60	60	1	
494	KWASMAN, AD	20	0	
495	SMITH, STEVE	30	0	
496	Write-in 40	40	1	
497	Write-in 50	50	1	
498	GOWAN, DAVI	30	0	
499	STEVENS, DAVI	40	0	
500	Write-in 50	50	1	
501	Write-in 60	60	1	
503	YES	10	0	
504	NO	20	0	
505	YES	10	0	
506	NO	20	0	
509	YES	10	0	
510	NO	20	0	
513	YES	10	0	
514	NO	20	0	
515	YES	10	0	
516	NO	20	0	
517	YES	10	0	
518	NO	20	0	
519	BITTER SMITH,	40	0	
520	BURNS, ROBER	50	0	
521	STUMP, BOB	60	0	
525	MILLER, ALLY	20	0	
526	Write-in 30	30	1	
527	KELLEY, JAMES	20	0	
528	Write-in 30	30	1	
529	BELL, TANNER	20	0	
530	Write-in 30	30	1	
531	CARROLL, RAY	10	0	
532	Write-in 20	20	1	
533	GONZALES, FER	20	0	
534	Write-in 30	30	1	
535	Write-in 20	20	1	
536	NAPIER, MARK	20	0	
537	CROTEAU, DAV	30	0	
538	Write-in 40	40	1	
539	BEARD, BILL	20	0	
540	Write-in 30	30	1	
541	FORD, BETH	20	0	
542	Write-in 30	30	1	

Candidate

6/26/2019

KeyId	Label	SortSeq	CandidateType	ExportId
543	Write-in 20	20	1	
544	ARZOUMANIA	10	0	
545	Write-in 20	20	1	
546	PEYTON, JACK	10	0	
547	Write-in 20	20	1	
548	LESTER, DAVID	20	0	
549	Write-in 30	30	1	
550	Write-in 20	20	1	
551	BROWN, R. C.	10	0	
552	ROBERTS, VINC	10	0	
553	YES	10	0	
554	NO	20	0	
555	YES	10	0	
556	NO	20	0	
557	WHITEHOUSE,	10	0	
558	Write-in 20	20	1	
559	GALVIN, SAND	10	0	
560	HOWELL, BRUC	20	0	
561	SHILLING, MIKE	30	0	
562	ST. JOHN, VALE	40	0	
563	Write-in 50	50	1	
564	Write-in 60	60	1	
565	Write-in 70	70	1	
566	Write-in 30	30	1	
567	DI NOTO, FRED	20	0	
568	HANSEN, DENN	30	0	
569	HEIDINGER, DO	40	0	
570	SARGENT, JEFF	50	0	
571	TREECE, MICH	60	0	
575	LANNON, ALBE	10	0	
576	MCCOOL, PEG	20	0	
577	ROBLES, ERNIE	30	0	
578	SEESE, DAVID S	40	0	
579	Write-in 50	50	1	
580	Write-in 60	60	1	
581	Write-in 70	70	1	
582	BERRY, ANTHO	10	0	
583	CARDILLO, RIC	20	0	
584	IZZO, RON	30	0	
585	RINALDI, JENNI	40	0	
586	RUPPEL, DOUG	50	0	
587	Write-in 60	60	1	

Candidate

6/26/2019

KeyId	Label	SortSeq	CandidateType	ExportId
588	Write-in 70	70	1	
589	Write-in 80	80	1	
590	BALL-CUMMIN	10	0	
591	CHUMNEY, JOA	20	0	
592	GUISE, ALECIA J	30	0	
593	KENDRICK, GAR	40	0	
594	SNIFFEN, MICH	50	0	
595	Write-in 60	60	1	
596	Write-in 70	70	1	
597	BOTEILHO, LOR	10	0	
606	Write-in 10	10	1	
607	Write-in 20	20	1	
608	Write-in 30	30	1	
610	CANTON, ANT	20	0	
611	GUNDERSON, L	30	0	
612	HEDDEN, ROBE	40	0	
613	MURPHY, LEO	50	0	
614	Write-in 60	60	1	
615	Write-in 70	70	1	
616	Write-in 80	80	1	
617	Write-in 90	90	1	
618	BAKARI, MENE	10	0	
619	CAMPOS-FLEE	20	0	
620	COTTON, DON	30	0	
621	CUEVAS, MIGU	40	0	
622	ELLINWOOD, R	50	0	
623	FOSTER, KRISTE	60	0	
624	HUNNICUTT, J	70	0	
625	JUAREZ, CAM S	80	0	
626	MEDLER, ROBE	90	0	
627	PUTNAM-HIDA	100	0	
628	STEGEMAN, M	110	0	
629	SUGIYAMA, AL	120	0	
630	Write-in 130	130	1	
631	Write-in 140	140	1	
632	Write-in 150	150	1	
633	CONDRA, ROG	10	0	
634	HOPKINS, SUZA	20	0	
635	LOPEZ, MARIBE	30	0	
636	POST, DAN	40	0	
637	Write-in 50	50	1	
638	Write-in 60	60	1	

Candidate

6/26/2019

KeyId	Label	SortSeq	CandidateType	ExportId
639	Write-in 70	70	1	
640	CROUCH, BUCK	10	0	
641	GARCIA, BOBB	20	0	
642	GONZALES, LO	30	0	
643	PAVEY, MALCO	40	0	
644	Write-in 50	50	1	
645	Write-in 60	60	1	
646	Write-in 70	70	1	
647	BURKHOLDER,	10	0	
648	COULTER, JIM	20	0	
649	KING, DEBBIE K	30	0	
650	KMAK, ANGELA	40	0	
651	STAGGS, DANA	50	0	
652	Write-in 60	60	1	
653	Write-in 70	70	1	
654	Write-in 80	80	1	
655	BERTSCH, NUBI	10	0	
656	HALL, J. ELAINE	20	0	
657	HAM, KRISTEN	30	0	
658	KELLERMEYER,	40	0	
659	Write-in 50	50	1	
660	Write-in 60	60	1	
661	Write-in 70	70	1	
662	YES	10	0	
663	NO	20	0	
664	YES	10	0	
665	NO	20	0	
666	YES	10	0	
667	NO	20	0	
668	YES	10	0	
669	NO	20	0	
670	YES	10	0	
671	NO	20	0	
672	OBAMA	10	0	
674	ROMNEY	20	0	
675	JOHNSON	30	0	
676	STEIN	40	0	
677	BAKER, BERYL	20	0	
678	Write-in 30	30	1	
679	Write-in 20	20	1	
680	Write-in 20	20	1	
681	Write-in 20	20	1	

Candidate

6/26/2019

KeyId	Label	SortSeq	CandidateType	ExportId
682	ESCAMILLA, JU	10	0	
683	OTONDO, LISA	20	0	
684	Write-in 30	30	1	
685	Write-in 40	40	1	
686	Write-in 50	50	1	
687	YES	10	0	
688	NO	20	0	
689	YES	10	0	
690	NO	20	0	
691	YES	10	0	
692	NO	20	0	
693	YES	10	0	
694	NO	20	0	
695	YES	10	0	
696	NO	20	0	
697	YES	10	0	
698	NO	20	0	
699	YES	10	0	
700	NO	20	0	
701	YES	10	0	
702	NO	20	0	
703	YES	10	0	
704	NO	20	0	
705	YES	10	0	
706	NO	20	0	
710	LEE, SYLVIA	10	0	
711	MARSHALL, SH	20	0	
712	Write-in 30	30	1	
713	CORTEZ, MART	10	0	
714	FRIDENA, RICH	20	0	
715	SAITTA, FRANCI	30	0	
716	Write-in 40	40	1	
719	YES	10	0	
720	NO	20	0	
721	YES	10	0	
722	NO	20	0	
723	Write-in 20	20	1	
724	Write-in 20	20	1	
725	VICTOR, MARC	30	0	
726	Write-in 40	40	1	
727	ALLEN, KIM	30	0	
728	Write-in 40	40	1	

Candidate

6/26/2019

KeyId	Label	SortSeq	CandidateType	ExportId
729	GOHL, CHRIST	70	0	
730	MEADOWS, TH	80	0	
731	POUT, DANIEL	90	0	
732	Write-in 100	100	1	
733	Write-in 110	110	1	
734	Write-in 120	120	1	
735	YES	10	0	
736	NO	20	0	
737	YES	10	0	
738	NO	20	0	
739	YES	10	0	
740	NO	20	0	
741	YES	10	0	
742	NO	20	0	
743	YES	10	0	
744	NO	20	0	
745	YES	10	0	
746	NO	20	0	
747	Write-in 50	50	1	
748	ARCHULETA, P	10	0	
749	Write-in 70	70	1	
750	Write-in 80	80	1	
751	Write-in 90	90	1	

CandidateCounter

6/26/2019

CounterBatchId	ReportUnitId	CounterGroupId	CandVGroupId	TotalVotes
590	4	0	10	180
590	4	0	41	240
590	4	0	188	187
590	4	0	244	157
590	4	0	245	164
590	4	0	246	160
590	4	0	271	224
590	4	0	289	255
590	4	0	295	190
590	4	0	306	221
590	4	0	312	179
590	4	0	318	250
590	4	0	462	170
590	4	0	468	161
590	4	0	469	18
590	4	0	503	193
590	4	0	504	74
590	4	0	505	191
590	4	0	506	75
590	4	0	509	189
590	4	0	510	75
590	4	0	513	192
590	4	0	514	68
590	4	0	515	189
590	4	0	516	73
590	4	0	517	191
590	4	0	518	68
590	4	0	519	131
590	4	0	520	143
590	4	0	521	133
590	4	0	529	141
590	4	0	535	4
590	4	0	536	157
590	4	0	537	19
590	4	0	539	136
590	4	0	541	184
590	4	0	543	5
590	4	0	544	249
590	4	0	545	4
590	4	0	553	110
590	4	0	554	214
590	4	0	555	112

Language

6/26/2019

KeyId	SortSeq	Label	ExportId	LocaleId	CountMethodM
0	0	English/Spanish		1033	1
1	10	English TS		1033	2
2	20	Spanish TS		1034	2

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IN THE UNITED STATES DISTRICT COURT
FOR THE NORTHERN DISTRICT OF GEORGIA
ATLANTA DIVISION

DONNA CURLING, et al.,

Plaintiffs,

v.

BRAD RAFFENSPERGER, et al.,

Defendants.

Civil Action No.
1:17-cv-02989-AT

DECLARATION OF THOMAS W. RYAN

Pursuant to 28 U.S.C. § 1746, I, Thomas W. Ryan, hereby declare as follows:

1. I have personal knowledge of the matters stated herein and would testify to the same if called as a witness in Court.
2. I am over the age of 21 and am otherwise competent to testify.
3. I have a Ph.D. in Electrical and Computer Engineering from the University of Arizona, awarded in 1980.
4. I was employed by Science Applications International Corporation (SAIC) from 1980 to 2007. My work there involved digital image processing. I was an algorithm designer, senior scientist, and project manager.

5. I have over 25 years of professional experience in the design, development, integration, and delivery of software systems. Some of my work involved security clearances so I am familiar with the nature of files that should have restricted access and those that should be visible to the public and stakeholders.
6. I have worked on public oversight of elections and election integrity issues since early 2003 when I co-authored a report on the Pima County election system.
7. I am familiar with the federal Voting System Standards that include the design and testing requirements for systems certified in the state of Arizona.
8. In 2004 I started Arizona Citizens for Fair Elections to promote better election practices.
9. From 2008 to 2018, I served as a member of the Pima County Election Integrity Commission, including four years as Chair of the Commission.
10. In 2005 and 2006 I was involved in developing election audit legislation that requires a sample hand count as a check against our computerized

voting system which is primarily a hand marked paper ballot system. This legislation was enacted by the Arizona legislature.

11. Pima County used the Diebold/GEMS voting system for a number of years before modernizing the voting system in 2016 and switching to a different system. The primary voting method was hand marked paper ballots counted by the Accu-vote optical scanning equipment with Diebold DREs used in the polling place for accessibility options.
12. My focus on election auditing derives from the fact that computerized voting systems are not transparent -- it is difficult, if not impossible, to see how the systems are interpreting ballots and aggregating results. As with electronic financial transactions, it is important that election voting be transparent and subjected to auditing and public oversight to be sure the systems are working properly.
13. The Diebold/GEMS system is particularly vulnerable to malicious data manipulation because the election database can be edited with the aid of commonly available software. Editing the database in this way leaves no traces in the election system activity logs.
14. Detection of data manipulation would require analysis of the election database to look for inconsistencies. Standard reports generated by the

GEMS system would rarely detect such manipulation or configuration errors.

15. The election database contains information about all the contests appearing on the ballot as well as tables that show the choices made by voters on individual anonymous ballots, referred to as cast vote records.

16. There is no information in the database that reveals any voter's identity or personal information.

17. Under court order, the GEMS databases were available for public inspection in Pima County from 2008 until the system was replaced in 2016. During that time, I am aware of no problems arising from the availability of the databases. Inspection of these databases showed that the reported election results were consistent with the data contained in the databases.

18. Minor irregularities were discovered in early available databases, including multiple uploads of precinct-tabulated ballot data, and cases where one or two individual ballots had been removed and later replaced. None of these irregularities affected reported election outcomes. No irregularities have been discovered in later databases.

19. Pima County replaced the Diebold/GEMS system in 2016 with a system from Election Systems and Software (ES&S). The databases from this

system are encrypted, but the Pima County Elections Department continues to export the critical portions of the database, including the cast vote records, for public inspection. No problems have results from the public availability of this data.

I declare under penalty of perjury that the foregoing is true and correct.

Executed this 30th day of June, 2019, in Boulder, Colorado.

A handwritten signature in black ink, appearing to read 'T. Ryan', is written above a horizontal line.

Thomas W. Ryan

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UNITED STATES DISTRICT COURT
FOR THE NORTHERN DISTRICT OF GEORGIA
ATLANTA DIVISION

DONNA CURLING,	et al.,)	
Plaintiffs,)	
)	CIVIL ACTION FILE
v.)	
)	NO. 1:17-cv-02989-AT
BRAD RAFFENSPERGER,	et al.,)	
Defendants.)	

DEPOSITION OF
TERESA LYNN LEDFORD

June 24, 2019



APG USA, INC.
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(770) 827-1223

UNITED STATES DISTRICT COURT
FOR THE NORTHERN DISTRICT OF GEORGIA
ATLANTA DIVISION

DONNA CURLING, et al.,)
)
 Plaintiffs,)
) CIVIL FILE ACTION
vs.)
) NO. 1:17-cv-02989-AT
)
BRAD RAFFENSPERGER, et al.,)
)
 Defendants.)

DEPOSITION OF
TERESA LYNN LEDFORD

June 24, 2019

9:40 a.m.

Gwinnett Justice and Administration Center

75 Langley Drive

Lawrenceville, Georgia

Marsi Koehl, CCR-B-2424



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Curling et al. v. Deposition of
 Raffensperger et al. T. LYNN LEDFORD

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8 Also present:

9 Marilyn Marks, Coalition for Good Governance
10
11
12
13
14
15
16

17 (Pursuant to OGCA 15-14-37 (a) and (b) a
18 written disclosure statement was submitted by the
19 court reporter and is attached hereto.)
20
21
22
23
24
25

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P R O C E E D I N G S

(Plaintiff's Exhibit 1 was marked for
identification.)

TERESA LYNN LEDFORD,
having been first duly sworn, was examined and
testified as follows:

EXAMINATION

BY MR. POWERS:

Q. Good morning, Ms. Ledford.

A. Good morning.

Q. I introduced myself before. My name is John
Powers and I'm an attorney with the Lawyers'
Committee for Civil Rights Under Law and one of the
counsels representing the plaintiffs in this case.

Could you please state and spell your full
name for the record.

A. It's Teresa Lynn Ledford. T-E-R-E-S-A.
L-Y-N-N. L-E-D-F-O-R-D.

Q. Thank you.

Ms. Ledford, have you ever been deposed
before?

A. No.

Q. Have you ever offered sworn testimony in any
other capacity?

A. Yes.

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1 MR. STEPHENS: As an affidavit.

2 THE WITNESS: Yes. Through the
3 affidavit process, yes.

4 BY MR. POWERS:

5 Q. In probably several cases?

6 A. Correct.

7 Q. Probably too many to go through right now.

8 A. Yeah, I couldn't tell you.

9 Q. Since this is your first deposition, I'll go
10 through a few of the ground rules.

11 First, do you understand that you're
12 testifying under oath just the same as if you're in a
13 court of law?

14 A. Yes.

15 Q. If you don't understand one of my questions,
16 please let me know and I'll try to rephrase it so
17 that you can understand. Is that okay?

18 A. Yes.

19 Q. And for the sake of the court reporter,
20 who's working hard today, if you could please wait
21 until I finish asking my question before you begin
22 answering it.

23 A. Yes.

24 Q. All right. And, lastly, you should please
25 feel free to take a break at any time just so long

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1 it's not while a question is pending. Is that okay?

2 A. Yes.

3 Q. All right. Do you have an official E-mail
4 address?

5 A. Yes. It's lynn.ledford@gwinnettcountry.com.

6 Q. Ms. Ledford, what did you do to prepare for
7 your deposition today?

8 A. Gather the information requested in the
9 subpoena.

10 Q. Great. And have you brought any of the
11 documents requested in plaintiff's subpoena with you
12 today?

13 A. Yes. I have.

14 (Plaintiff's Exhibit 2 was marked for
15 identification.)

16 BY MR. POWERS:

17 Q. Before we go further, I'll go ahead and hand
18 you what I've marked for identification as
19 Plaintiff's Exhibit 2.

20 Ms. Ledford, is Plaintiff's Exhibit 2 the
21 subpoena that you were referring to from the
22 Coalition for Good Governance?

23 A. Yes.

24 Q. Ms. Ledford, what documents have you brought
25 with you today in response to plaintiff's subpoena,

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1 Plaintiff's Exhibit No. 2?

2 A. This is the number of provisional ballots
3 partially counted, fully counted and rejected.

4 MR. POWERS: And I'm going to go -- and
5 maybe we can go through them one at a time.

6 MR. STEPHENS: In order, mm-hmm.

7 (Plaintiff's Exhibit 3 was marked for
8 identification.)

9 BY MR. POWERS:

10 Q. So, Ms. Ledford, you handed what I've now
11 marked as Plaintiff's Exhibit 3.

12 And could you please tell me what
13 Plaintiff's Exhibit No. 3 is?

14 A. It is the summary of provisional ballots.

15 MR. STEPHENS: I believe that's in
16 response to No. 15.

17 MR. POWERS: Great.

18 THE WITNESS: This is comments from
19 voters regarding the voting equipment.

20 MR. POWERS: Okay. And I'm marking that
21 document as Plaintiff's Exhibit No. 4.

22 THE WITNESS: Yes.

23 (Plaintiff's Exhibit 4 was marked for
24 identification.)

25 MR. STEPHENS: Let's try to identify

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1 which one of the items that is.

2 BY MR. POWERS:

3 Q. Ms. Ledford, can you please identify which
4 subpoena question this --

5 A. Number 11.

6 MR. STEPHENS: Eleven, okay?

7 BY MR. POWERS:

8 Q. So Plaintiff's Exhibit No. 4 was produced in
9 response to --

10 A. -- No. 11.

11 Q. -- request No. 11 of plaintiff's subpoena.
12 Thank you.

13 A. This is the intergovernmental agreement
14 between Gwinnett County Board of Voter Registration
15 Elections and the cities for 2017 and 2019. And that
16 is No. 16 on the subpoena.

17 (Plaintiff's Exhibit 5 was marked for
18 identification.)

19 BY MR. POWERS:

20 Q. I'm going to go ahead and mark that for
21 identification Plaintiff's Exhibit No. 5.

22 Just to reiterate, Plaintiff's Exhibit No. 5
23 is in response to what request number from
24 plaintiff's subpoena?

25 A. Sixteen.

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1 Q. Thank you.

2 A. I'm looking for the number on this one.

3 Okay. This is No. 17. This is
4 communications and documents regarding the procedure
5 for electronic transmission and receipt of
6 election-rated files.

7 MR. POWERS: I'm going to go ahead and
8 mark this document as Plaintiff's Exhibit
9 No. 6.

10 (Plaintiff's Exhibit 6 was marked for
11 identification.)

12 BY MR. POWERS:

13 Q. And just to reiterate, you said that is in
14 response to subpoena request No. 17?

15 A. Correct.

16 Q. What's next?

17 A. This actually goes with that as well. I'm
18 sorry. There's three pages to that, three sets to
19 that one.

20 Q. So let's add that into Plaintiff's Exhibit
21 No. 6.

22 A. This is No. 8. This is bulletins regarding
23 electronic updates about security on the GEMS
24 servers.

25 MR. POWERS: I'm going to mark this

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1 document as Plaintiff's Exhibit No. 7.

2 (Plaintiff's Exhibit 7 was marked for
3 identification.)

4 BY MR. POWERS:

5 Q. And just to reiterate, you said Plaintiff's
6 Exhibit No. 7 was produced in response to plaintiff's
7 subpoena request No. 8?

8 A. Correct. That's all I have.

9 Q. Okay. And I understand there are some
10 documents -- strike that.

11 Are there any documents that you have
12 identified that you are not producing today?

13 A. Yes.

14 Q. What documents are those?

15 MR. STEPHENS: Let me -- let's just go
16 through this -- in fact, if we can go
17 through the request for production of
18 documents.

19 MR. POWERS: Sure.

20 MR. TYSON: That might work and then we
21 can state the objections and go from there.

22 MR. POWERS: Okay.

23 MR. STEPHENS: All right. As to request
24 No. 1, I think the State had an objection to
25 that.

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1 MR. TYSON: Yes. So the State
2 defendants object to request No. 1 as
3 outlined in our letter yesterday evening.
4 The GEMS database is a state-owned system
5 and it's protected from disclosure by state
6 law and has already been the subject of some
7 back and forth between parties regarding its
8 disclosure.

9 We'll been talking with Judge Totenberg
10 about that disclosure later in the week.

11 But it is our contention that this is
12 protected from disclosure by state law
13 because it could be used to inject malware
14 or other software into the system that
15 could affect -- adversely affect election
16 security.

17 So State defendants object to any
18 disclosure of the GEMS database under
19 request No. 1.

20 MR. STEPHENS: And as to Ms. Ledford,
21 she also objects and shares in that -- joins
22 in that objection.

23 We also prior to the deposition today
24 handed you our written objection to Item
25 No. 1 as well as a few others.

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1 Item 1 requests the GEMS database. And
2 that -- once the election -- and it's the
3 database for the November 2018 election.

4 Once that election is completed, the
5 GEMS database is delivered to the clerk of
6 the superior court and it remains in the
7 clerk's possession for a couple of years
8 under seal and can only be released through
9 a court order. It is then given to the
10 grand jury to take a look at it and maybe
11 it's disposed of it at that point.

12 It contains privileged and protected
13 information. And production would have the
14 effect of rendering the State's electoral
15 system insecure and vulnerable to attack.
16 It would also jeopardize the security of our
17 present election system.

18 And we've given you citations to a case
19 in which this issue was discussed and a
20 citation to 21-2-500 on that point.

21 MR. POWERS: Are there any other
22 objections you want to state for the
23 record or can we move on?

24 MR. STEPHENS: Let's go through these.

25 Request No. 2, there are no documents

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1 that Ms. Ledford has identified that are
2 responsive to this request. We did oppose
3 the objection that is contained in the
4 letter, but there are no documents by the
5 same token.

6 No. 3, policies, procedures, manuals and
7 other documents relating to or describing
8 the assignment of unique identifiers to
9 electronic ballot image reports or cast vote
10 records. There are no documents responsive
11 to that request. As a matter of fact, I
12 understand that the Elections Division does
13 not do that. Is that correct, Lynn?

14 THE WITNESS: Correct.

15 MR. STEPHENS: In paragraph four, it's
16 requesting policies, procedures, manuals
17 relating to or describing the method of
18 retrieval of electronic ballot information
19 from specific cast electronic ballots for
20 purposes of research or canceling the
21 ballots or votes.

22 There are no documents responsive to
23 that request. And, again, my understanding
24 is that the Elections Division does not do
25 that. Is that correct?

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1 THE WITNESS: Correct.

2 MR. STEPHENS: Okay. Paragraph five,
3 you've asked for ballot image reports for
4 cast vote records of the first five ballots
5 cast and the last five ballots cast in the
6 November 6, 2018, election at Martins E
7 Precinct.

8 There are no documents that are
9 responsive to this request. And I
10 understand that it would be impossible for
11 us to retrieve that. Is that correct?

12 THE WITNESS: That's correct.

13 MR. STEPHENS: And would you describe
14 why that's not possible?

15 THE WITNESS: Yes. In order to keep the
16 anonymity of the voter and the integrity of
17 the system, once a ballot is cast, it then
18 becomes randomized throughout the unit, so
19 you couldn't take a numbered list of voters
20 and know that the first five people, this is
21 the first five ballots, so you would be able
22 to see how those voters cast their ballots.
23 So we don't have the option of getting this
24 information.

25 MR. STEPHENS: Would the same hold true

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1 of No. 6?

2 THE WITNESS: Correct.

3 MR. STEPHENS: It's just a different
4 precinct.

5 THE WITNESS: Correct.

6 MR. STEPHENS: And we have objected to
7 five and six as seen in the letter, but
8 there are no documents responsive to that
9 request.

10 Then let me make sure I'm going through
11 and checking these.

12 On 7, nondisclosure agreement signed by
13 the Gwinnett election officials related to
14 election data contained in the County's GEMS
15 database. There are no documents responsive
16 to this one and I understand we don't have
17 any such agreements. Is that correct?

18 THE WITNESS: Correct.

19 MR. STEPHENS: We've already talked
20 about eight and produced documents.

21 Let's see. No. 9, instructions,
22 bulletins and electronic updates, receipt
23 from the Secretary of State's Office related
24 to security threats to the voting system or
25 election-related equipment since January 1st

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1 of 2016.

2 THE WITNESS: We had those.

3 MR. STEPHENS: Okay. There's -- oh,
4 that's right. That's --

5 MR. TYSON: -- included in Exhibit 7, I
6 believe, updates regarding the DRE system
7 and regarding the voting system at large.

8 Does that sound right?

9 THE WITNESS: Mm-hmm.

10 MR. STEPHENS: I guess we have produced
11 those. So we're on 10, I think, right now.

12 MR. POWERS: Yeah.

13 MR. STEPHENS: And that dealt with
14 documents related to preventing voters who
15 appear at the wrong polling place in some
16 elections from being located in an express
17 poll book and redirected by poll workers to
18 a second incorrect polling place.

19 There are no documents responsive to
20 this request and that's not a practice of
21 ours. Is it?

22 THE WITNESS: Correct.

23 MR. STEPHENS: We've produced documents
24 responsive to 11.

25 Twelve involves investigations

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1 concerning the undervote in the lieutenant
2 governor's race in the November 2018
3 elections. There were no documents
4 responsive to that request. Is that right?

5 THE WITNESS: Correct.

6 MR. STEPHENS: And then I think we just
7 have 13 and 14 that we have not responded to
8 with documents.

9 Thirteen is complaints received from
10 voters, poll workers or Gwinnett County
11 staff regarding inaccuracies in voter
12 information in the electronic poll books
13 during the November elections.

14 Were there any documents responsive to
15 that?

16 THE WITNESS: No.

17 MR. STEPHENS: And the last one is the
18 one that we've also objected to, which is
19 the records concerning or related to changes
20 made to the voter registration information
21 or the electronic poll book information for
22 Gwinnett county voters Dana Bowers and
23 Jasmine Clark since January 1st, 2018.

24 Both the State and we have objected to
25 that and I'll let the State make its

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1 objection.

2 MR. TYSON: And the objection there is
3 the records related to the voter
4 registration information from the ENet
5 database include nonpublic information that
6 is protected from disclosure about the
7 individual voters.

8 We have no objection to the production
9 pursuant to a protective order when one is
10 entered, but there has not yet been a
11 protective order entered in the case.

12 And so until such time as that
13 protective order is entered, the State would
14 object to disclosure of the audit records
15 and nonpublic information from the ENet
16 database regarding those voters.

17 MR. STEPHENS: We concur in that
18 objection.

19 And I will say with regard to the
20 objection, in No. 1 dealing with the GEMS
21 database, that we will, of course, comply
22 with any court order that's entered. That
23 information is by Georgia law stored
24 securely pending a court order. And if a
25 court order is entered with protective

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1 provisions, then, of course, we'll comply
2 with that.

3 MR. POWERS: Okay.

4 MR. STEPHENS: And I believe that covers
5 all the request for production.

6 MR. POWERS: I think -- what about 15,
7 16 and 17?

8 MR. STEPHENS: Let's see. I had that we
9 produced documents under 15, 16 and 17.

10 MR. POWERS: Okay. I have that for my
11 records.

12 Great. We may return to this later.

13 MR. STEPHENS: All right.

14 BY MR. POWERS:

15 Q. For right now, let's move on.

16 Ms. Ledford, you were born in Gwinnett
17 County?

18 A. Yes.

19 Q. Are you a lifelong resident of Gwinnett
20 County?

21 A. Yes.

22 Q. And where in Gwinnett County do you live?

23 A. Grayson.

24 Q. Do you live in the incorporated part of
25 Grayson?

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1 A. No.

2 Q. Could you please tell me about your
3 professional employment history and background.

4 A. Sure. I started working for Gwinnett County
5 in October of 1987 as a temporary employee. In
6 February of '88, I went to being a full-time
7 employee.

8 I started out as a clerk then graduated to
9 voter registration coordinator and then assistant
10 director and then director.

11 Q. So you're currently the elections director
12 for Gwinnett County?

13 A. Yes.

14 Q. How long have you been elections director
15 for Gwinnett County?

16 A. I believe since the end of 2001.

17 Q. And before that, you were the assistant
18 elections director?

19 A. Yes.

20 Q. How long were you the assistant elections
21 director for?

22 A. I don't remember.

23 Q. What was your title before assistant
24 elections director?

25 A. Voter registration coordinator.

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1 Q. What responsibilities do you have as the
2 elections director for Gwinnett County?

3 A. To ensure compliance with Title 21.

4 Q. That's of the Georgia Election Code?

5 A. Yes. Official Code of Georgia Annotated.

6 Q. What are your responsibilities that you take
7 on to make sure that that happens?

8 A. Well, I make sure I understand the code and
9 state laws, rules and regulations in regard to all
10 voter registration and election processes.

11 So I have a staff and I oversee that staff
12 to ensure all of those things take place based on
13 deadlines, timelines and statutory requirements.

14 Q. What kinds of duties do you take on on a
15 day-to-day level?

16 A. That's hard to say. It depends. If we're
17 in an election cycle, the duties are obviously
18 different than in a nonelection cycle.

19 In an election cycle, we set up a calendar
20 for, again, deadlines for absentee balloting by mail,
21 advanced in-person voting, setting up our polling
22 locations, training, staffing, replacement of all the
23 training and staffing that we do.

24 We set up online and in-person training for
25 the poll officials. In addition to that, we are the

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1 official recorder for campaign filings and
2 disclosures for candidates and campaigns. We
3 maintain all that in our office as well.

4 And then, obviously, year round we do voter
5 registration and all the processes that go along with
6 that, including list maintenance, day-to-day --

7 (Reporter requests that witness slow
8 down.)

9 THE WITNESS: Which includes list
10 maintenance, activities, updates, new
11 registrations both online and manual.

12 BY MR. POWERS:

13 Q. Roughly, how many registered voters are
14 there in Gwinnett County?

15 A. We have right at 600,000. Approximately
16 550,000 active and then approximately forty to 50,000
17 inactive.

18 Q. It takes a lot of organization to manage an
19 operation of this size?

20 A. Yes. It does.

21 Q. What training or certifications have you
22 received related to election administration?

23 A. The Georgia Association of Voters Registrars
24 and the Georgia Election Officials Association.

25 We have two separate associations in Georgia

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1 and I go to those trainings any time they are held.
2 I have also done any special trainings that were
3 provided by the Secretary of State's Office over the
4 years.

5 Q. How frequently are those special trainings
6 held?

7 A. They are infrequent.

8 Q. Has the Secretary held any special trainings
9 related to the DRE voting machines?

10 A. Not for me because I've been here -- been
11 doing it for 30 something years.

12 Q. Have you been an instructor in any of the
13 trainings administered around the state?

14 A. I have.

15 Q. Could you please tell me about those?

16 A. It varies. It depends on what the
17 association is concentrating on for that particular
18 election. We have done staffing and recruiting. I
19 have done voter registration practices and
20 procedures. We've also done some type -- so it's
21 just over -- like I said, I've been in association
22 for many, many years, so there's been a lot of
23 trainings I've worked on.

24 Q. That's fair enough.

25 Have you served in important roles in the

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1 election administration field at the statewide level
2 in Georgia?

3 A. I have since Cathy Cox was the secretary of
4 state, I was appointed to several committees under
5 her. The subsequent secretaries of states, I've been
6 appointed to several -- I couldn't tell you exactly
7 but to different committees.

8 And then the latest one I served on was
9 Governor Brian Kemp put together a blue ribbon
10 commission to study the Georgia Election Code. And
11 there were several of us on that committee and that
12 was probably three or four years ago.

13 Q. Was this the election code review committee?

14 A. It was.

15 Q. What did that committee look at?

16 A. Everything from page 1 to the last page and
17 just -- again, just reviewed all of that.

18 Q. Was the election code review committee
19 involved at all in the creation or review of House
20 Bill 316 that was passed in 2019?

21 A. No.

22 Q. Were you personally involved in the creation
23 or review of House Bill 316?

24 A. No.

25 Q. Ms. Ledford, were you -- have you served as

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1 president of the Georgia Elections Officials
2 Association?

3 A. Yes.

4 Q. And, roughly, when did you serve in that
5 role?

6 A. Maybe 10 years ago, roughly. I don't
7 remember exactly but about eight to 10 years ago.

8 Q. Have you served on the national task force
9 for poll worker and public education?

10 A. I don't think so.

11 Q. Have you served on committees with the Voter
12 Registrars Association of Georgia?

13 A. Yes.

14 Q. Could you tell me a little about that?

15 A. No. I don't remember. There's a lot of
16 years so a lot of committees.

17 Q. Fair enough.

18 Is it fair to say that through these various
19 roles, you're knowledgeable about the election
20 administration practices and procedures employed by
21 counties throughout Georgia?

22 A. In Gwinnett County, Georgia.

23 Q. Does that knowledge extend to the voting
24 methods and systems used in other counties in
25 Georgia?

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1 A. I know how Gwinnett County conducts our
2 policies and procedures. I don't want to speculate
3 how other counties would interpret and apply laws,
4 rules and regulations.

5 Q. What has your role been with respect to
6 implementing and using the DRE voting machine system
7 that's used in Gwinnett County elections?

8 A. Well, I was the assistant director when we
9 began using DREs in 2002. So just being the
10 assistant, I worked on the distribution of the
11 equipment and how -- which precincts were going to
12 get how much equipment; looking at numbers of
13 registered voters. And then I assisted in
14 implementing the L&A testing that we use.

15 Of course, all the instruction was provided
16 by the Secretary of State, so we just implemented
17 what was provided to us.

18 Q. What was your role with respect to
19 implementing the logic and accuracy testing?

20 A. Just making sure the paperwork was in order
21 and verifying it afterward.

22 Q. We'll probably return to that subject later
23 on.

24 Who at the Gwinnett County Board of
25 Elections is responsible for ensuring that the DRE

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1 voting system used in the county is functioning
2 properly?

3 A. The Elections Division and staff.

4 Q. Which staff members specifically?

5 A. Well, we have an election coordinator who
6 heads that up and then he has two election
7 associates, two that work under him and then we hire
8 approximately five to 15 to 20 depending on the type
9 of election, temporary employees.

10 Q. What is the name of the election
11 coordinator?

12 A. Kelvin Williams.

13 Q. What are the names of the other two staff
14 members that you mentioned who do a lot of work on
15 this?

16 A. Demond Smith and Tiffany Vang.

17 Q. Thank you.

18 Ms. Ledford, what is the annual budget of
19 the Gwinnett County Board of Elections roughly
20 speaking?

21 A. Again, it depends. In an election year, it
22 can be five to ten million depending on the election
23 cycle that we're in. In an off-election year, we
24 only have what we call an admin budget and that's
25 usually anywhere from 1.5 to three million.

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1 Q. Let's talk about the Gwinnett County Board
2 of Elections' budget in an election year.

3 What are the major line items that take up
4 the bulk of the five- to ten-million-dollar budget
5 that you just referred to?

6 A. Poll official payroll.

7 Q. What else?

8 A. Professional services.

9 Q. What constitutes professional services?

10 A. Temporary employees and translation.

11 Q. You're talking about Spanish language
12 translation?

13 A. Correct.

14 Q. How much of that budget goes into DRE
15 machine testing and maintenance?

16 A. I couldn't tell you exactly.

17 Q. Is it hard work to do the DRE machine
18 testing and maintenance?

19 A. It is.

20 Q. Could you tell me about the pieces that go
21 into the DRE machine testing and maintenance?

22 A. Sure. It's a couple of tests. We perform
23 what's called a diagnostic test, which means we
24 ensure that the touches on the machine match up what
25 they should.

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1 The second part of the testing is what we
2 call automatic L&A. And you run a series of tests on
3 that and it produces a pattern. And we verify that
4 that pattern is correct based on what we know it
5 should be for that election. And that is all
6 documented.

7 Q. So the Gwinnett County Board of Elections
8 has documents reflecting diagnostic tests and the
9 automatic logic and accuracy testing?

10 A. Yes.

11 Q. Are those tests run on every single
12 DRE machine that's used in early voting and
13 election day?

14 A. Yes.

15 Q. How many DRE machines does Gwinnett County
16 own?

17 A. Roughly 1800.

18 Q. How many of those are used in an even-year
19 election cycle?

20 A. It just depends on what election cycle we're
21 in. Obviously, the gubernatorial year doesn't
22 require as many as a presidential year and so we base
23 it on past history and anticipation.

24 Q. Fair enough. So say the November 2018
25 general election, roughly, how many voting machines

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1 did you use for that election?

2 A. I don't know because I don't remember.

3 Q. In a presidential election year, does the
4 County use all of its DRE voting machines?

5 A. We do not.

6 Q. Do you recall what the greatest number of
7 DRE machines the County has used in a particular
8 election?

9 A. I do not.

10 Q. How much does it cost to store the DRE
11 machines?

12 A. Nothing.

13 Q. The County doesn't pay for the storage of
14 the DRE machine?

15 A. Huh-uh.

16 Q. Who pays for that?

17 A. They are stored onsite in a secure location.

18 Q. On county property?

19 A. Yes.

20 Q. You might have mentioned this before.

21 When did Gwinnett County begin using the
22 current DRE voting system?

23 A. 2002.

24 Q. What voting method was in place for in-vote
25 in-person -- sorry.

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1 What voting method was in place for
2 in-person voting on election day in Gwinnett County
3 before the current DRE system?

4 A. The optical scan system.

5 Q. Could you please describe that optical scan
6 system for me?

7 A. It's the same system that we use today for
8 absentee and provisional balloting. It's a bubble-in
9 system. And the voter is provided their particular
10 ballot style. They would have voted by bubbling it
11 in and then they would have put it into the scanner
12 prior to leaving the poll.

13 Q. Hand-marked paper ballots?

14 A. Yes.

15 Q. How long was that optical scan hand-marked
16 paper ballot voting system used for?

17 A. Two years.

18 Q. What brand or manufacturer was used for the
19 optical scan system?

20 A. At the time it was called GEMS, Global
21 Elections Management System.

22 Q. Thank you.

23 And before that optical scan system, what
24 voting method did Gwinnett County use?

25 A. Punch card.

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1 Q. Could you describe the punch card voting
2 system?

3 A. Really?

4 The voter would be provided their ballot.
5 If it was a primary, they would have to specify
6 Democrat or Republican because you had different
7 voting booths.

8 The voter would then be given a card and
9 they would slip it into a little unit. And there was
10 a tiny punch. And you had a booklet. And the
11 numbers in that booklet coincided with the ballot and
12 so they would punch whichever number matched the
13 person that they wanted to vote for.

14 At the end, they would take it out and then
15 it would be placed into a ballot box -- a locked
16 ballot box.

17 Q. Is that similar to -- were there chads or --

18 A. Yes. That's exactly what it was. It was
19 that system.

20 Q. Oh. And how long was the punch card system
21 used for as best you know?

22 A. From my knowledge, from 1973 until we
23 purchased the new system in 1999.

24 Q. Do you recall receiving complaints from
25 voters about the punch card system?

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1 A. I don't remember.

2 Q. Fair enough.

3 Let's go back and talk about the optical
4 scan system a little more.

5 You mentioned that it was in place for
6 two years. Which years was the optical scan system
7 in place for?

8 A. 2000 and 2001.

9 Q. So the optical scan system was in place for
10 the 2000 presidential election?

11 A. Yes.

12 Q. Do you recall if the optical scan system was
13 used only by Gwinnett County or if it was something
14 that other counties in Georgia were also doing?

15 A. To my knowledge, there were only two
16 counties: Gwinnett and Chatham.

17 Q. Your role at the time was assistant
18 elections director?

19 A. Correct.

20 Q. What role did you play with respect to
21 implementing the optical scan system?

22 A. I was partly involved with the decision on
23 the vendor. We had several demonstrations. Once it
24 was chosen, then I worked with the elections director
25 at the time and the staff to develop the training and

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1 L&A testing for that as well, again, which at that
2 time would have been provided by the vendor.

3 Q. Can you describe the kind of logic and
4 accuracy testing that was used on the optical scan
5 testing?

6 A. Very similar. You do diagnostic testing
7 first to make sure the unit itself is operational,
8 reading the bubbles.

9 And then the second part was much more
10 difficult than the DRE system because you had to
11 develop a handwritten -- or hand-marked test deck.
12 And you had to create that certain pattern. So we
13 had thousands and thousands of optical scan ballots
14 and based upon the style would have to be read into
15 those units. And it took a significant amount of
16 time to create those test decks.

17 Q. Understood.

18 When ballots were cast in person on election
19 day using the optical scan system, were the ballots
20 counted at each polling place or at the County Board
21 of Elections Office?

22 A. They were tabulated onto the memory card in
23 each of the OS units and then that information was
24 brought back to the Elections Office for the official
25 certification. So it was aggregated at the Elections

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1 Office.

2 Q. Did you think that the county's processes
3 for counting the hand-marked paper ballots were
4 affected?

5 A. "Counting" meaning for the poll officials or
6 for the main office?

7 Q. Both.

8 A. Well, it was difficult for the poll
9 officials because optical scan ballots carry a
10 different set of problems just like any set does.
11 And if you had a voter who overvoted a ballot or had
12 something wrong with it and the unit wouldn't take
13 it, that ballot would be spoiled. The voter would be
14 given an addition ballot. They would have to go
15 down --

16 (Reporter requests that witness slow
17 down.)

18 THE WITNESS: The voter would be given
19 the option to take a second ballot or
20 continue to have that ballot spoiled and not
21 cast. And we had that happen more
22 frequently than I think people realize
23 because they didn't want to go back and do
24 that. And so it created, you know, a
25 significant issue with that.

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1 The machines themselves were not
2 problems. As far as the tabulation, the
3 aggregation of the results, it was not an
4 issue.

5 BY MR. POWERS:

6 Q. Mm-hmm. Do you recall how many complaints
7 you -- strike that.

8 Do you recall receiving any complaints from
9 voters about having to cast the second paper ballot
10 or not having their paper ballots scanned properly?

11 A. Yes.

12 Q. How many complaints do you recall receiving?

13 A. I don't. It's been too long. And like I
14 said, we only used it for two years. It was
15 significant enough that it stuck in my mind is the
16 only way I know how to describe that.

17 Q. Sure. Do you have any -- strike that.

18 Did you have any concerns about the
19 integrity of the elections that were conducted in
20 Gwinnett County using the hand-marked paper ballots?

21 A. I don't remember.

22 Q. Sitting here today, do you have any concerns
23 about the integrity of the elections that were
24 conducted in Gwinnett County using hand-marked paper
25 ballots?

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1 A. No.

2 Q. Do you recall experiencing any problems with
3 the optical scanning system besides those that you
4 just described?

5 A. Yes. Occasionally -- the unit itself has
6 the memory card and memory card has a battery in it.
7 And, obviously, you don't always know the battery
8 life. You buy them off the shelf and you think they
9 are brand-new, but, perhaps, they are older.

10 So oftentimes the battery would die in a
11 memory card. And, of course, the poll officials had
12 back-up memory cards, but that would stop voting.
13 And there was a process that they had to go through
14 to remove the dead memory card and insert the new
15 one.

16 And then that translated also as well to the
17 aggregation of the results on election nights; we
18 would be doing -- trying to download results and we
19 wouldn't be able to because the battery would die.
20 So we would have to take that memory card, change out
21 the battery and get the elections results.

22 Q. Could you explain to me -- I admit I don't
23 know all the technology.

24 Could you please explain the difference to
25 me between memory cards that are used for the optical

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1 scan system and the memory cards that are used for
2 the current DRE voting system?

3 A. I can't give you the technical. I can give
4 you the user end. They are very, very similar. They
5 are both used to get the election -- the votes cast.

6 Both optical scan and DRE units have
7 redundant memory where votes casts are stored so that
8 if you absolutely get the information from the card,
9 you can get it from the unit.

10 Q. Any other differences?

11 A. Again, I'm not a techie, so I can only give
12 you the user end of it.

13 Q. To the best of your knowledge, were there
14 any differences?

15 A. No.

16 Q. The battery problem that you described with
17 respect to the optical scan system, wouldn't that
18 also apply to the current DRE voting system memory
19 cards?

20 A. It does not seem to. And I believe that is
21 due to the fact that those units are charged every
22 three months. And so even if the battery -- if
23 something happened in the memory card, the battery in
24 the unit will hold for four hours.

25 Q. Could you charge the batteries for the

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1 optical scan system?

2 A. No. Because that battery is totally
3 contained within the little memory -- it's a watch
4 battery.

5 Q. I just learned something.

6 Going back to my earlier question. Do you
7 recall there being any other complaints from voters
8 about the optical scan system used in 2000 and 2001?

9 A. The only other one was the amount of time it
10 took to do a recount because you have to handfeed all
11 of that information again. You don't upload the
12 card.

13 Q. Did you conduct any recounts in 2000 or 2001
14 while the optical scan system was in place?

15 A. We did and it was a statewide. I don't
16 remember the race, but it was a statewide race and it
17 was thousands and thousands of ballots.

18 Q. Mm-hmm. Do you recall roughly how long the
19 recount took?

20 A. I believe it was a day and-a-half and that
21 was a solid eight hours with several units. I don't
22 remember the number. Several units being utilized
23 and the staff rotating, you know, because you
24 couldn't -- you had to stand to do it and we couldn't
25 stand for that amount of time. Like I said, it was

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1 significant.

2 Q. Got it. And so just to make sure I
3 understand it correctly, it took a day and-a-half to
4 feed all of the hand-marked paper ballots cast in
5 Gwinnett County for that statewide election through
6 the optical scanners?

7 A. Correct.

8 Q. Thank you.

9 Any other complaints?

10 A. Not to my knowledge.

11 Q. Switching gears for a second, Ms. Ledford,
12 would you please describe for me Gwinnett's election
13 calendar for 2019?

14 A. Our election -- well, we had a special
15 transportation referendum in March.

16 Q. Is Gwinnett County conducting any other
17 elections in 2019?

18 A. No.

19 Q. What is Gwinnett County's election calendar
20 for 2020?

21 A. Full. We have the presidential preference
22 primary, the general primary, a potential general
23 primary runoff, a potential federal primary runoff,
24 the general election, the general election runoff and
25 then a potential federal election runoff.

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1 So that's, what, six, eight potential
2 elections. So it's from -- we already start
3 preparing this year for next year.

4 Q. Understood. What kinds of preparations are
5 you making this year for next year's election?

6 A. Well, currently, we're in the process of
7 looking at our training, not necessarily the
8 equipment specific because we don't know what that is
9 but procedures around the poll officials' processes
10 for proof of U.S. citizenship, voter registration
11 reconciliation problems, what to do in emergency
12 situations. At this point that's really all that
13 we've tagged onto for that.

14 Q. I'd like to turn back briefly to Plaintiff's
15 Exhibit 5, which -- which we talked -- we marked
16 before. And since there's one copy, let's -- this
17 will be a little tricky.

18 But could you describe to me the -- what
19 Plaintiff's Exhibit 5 is and, perhaps, we can go from
20 there.

21 A. Sure. These are the intergovernmental
22 agreements for the loan of the election equipment to
23 the cities in Gwinnett County.

24 Q. Mm-hmm. Which cities were these agreements
25 signed with?

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1 A. Duluth. Lawrenceville. Lilburn. Norcross.
2 Peachtree Corners. Snellville. Sugar Hill. And
3 that's for 2017 and 2019 respectively.

4 Q. Would you mind describing the content of the
5 contracts in a little more detail?

6 A. It's basically just saying that we will not
7 conduct your election, but we will allow you the loan
8 of the equipment to conduct your elections. And then
9 we provide whatever number pieces of equipment that
10 they're requesting.

11 Q. Is the number of machines requested part of
12 that agreement?

13 A. It is. I don't -- yes, it is.

14 Q. And so --

15 A. It's actually -- no. There's another sheet
16 that they send in that we don't actually put with the
17 contract. So we'll have to get that.

18 So that tells us how many voting machines
19 they want, how many optical scan units and the
20 peripherals that go with them.

21 Q. Do you know sitting here now the number of
22 machines that --

23 A. It's usually less than 10.

24 Q. Is it roughly less than 10 per city?

25 A. Correct.

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1 Q. Are each of the cities with whom there's an
2 intergovernmental agreement conducting a municipal
3 election in 2019?

4 A. Not necessarily. They go ahead and submit
5 the IGAs because of the process they have go through
6 with their city councils and with our Elections Board
7 so that we have them in place. If they do let us
8 know they're having an election, then we can set
9 aside the equipment that they've requested.

10 Q. How does the process work logistically in
11 terms of the Gwinnett County BOE transferring custody
12 to the cities? How does that work?

13 A. Once we know they are having an election,
14 again, we set aside the number that they want. And
15 then if they tell us they are having an election,
16 they tell us what date they need it and then they
17 come and pick up their equipment. And then they set
18 it up, take custody and then they bring it back to us
19 after the election.

20 Q. What training do you provide, if any,
21 related to the use of the DRE voting machines?

22 A. We do not.

23 Q. You don't provide any training --

24 A. We do not, huh-uh.

25 Q. What -- strike that.

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1 What are the security controls that
2 municipalities have to follow with respect to their
3 use of the DRE voting machines?

4 A. I don't know. I would assume it's the same
5 as ours. And I'm not supposed to say "assume." But
6 we don't train them, so we don't know. Their
7 information comes from the Secretary of State's
8 Office, but I'm sure they are very well aware they
9 are supposed to keep everything sealed.

10 Q. Could you describe what you mean with
11 respect to keeping the DRE machines sealed?

12 A. Well, once they are -- you unseal them at
13 the beginning of the day and then you reseal them at
14 the end of the day with a numbered seal and there's
15 various numbered seals.

16 Q. Does the -- strike that.

17 Do the cities provide documentation with
18 respect to the seals when they return the DRE
19 machines to you?

20 A. I don't know.

21 Q. Do you know if the Gwinnett County BORE has
22 any records of sealed information provided by the
23 municipalities?

24 A. I don't know.

25 Q. How are the DRE machines -- strike that.

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1 Who does the programming for the DRE
2 machines in municipal elections?

3 A. I don't know.

4 Q. Is it fair to say the Gwinnett County Board
5 of Elections does not do the programming for the --

6 A. Correct.

7 Q. Sorry. Let me finish my question.

8 A. Oh.

9 Q. Is it fair to say that the Gwinnett County
10 Board of Elections does not do the testing for DRE
11 machines for municipal elections?

12 A. Correct.

13 Q. Thank you.

14 Do you know if municipalities have GEMS
15 licenses?

16 A. I do not.

17 Q. Does the Gwinnett County Board of Elections
18 provide any kind of guidance or share any information
19 with municipalities related to the use of DRE voting
20 machines?

21 A. We do not.

22 Q. Let's switch gears for a second and talk
23 about last second changes that the board of elections
24 might have to make before an election.

25 Can you recall any instances in which

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1 Gwinnett County officials had to make last second
2 changes or adjustments to plans for conducting
3 elections?

4 A. Yes.

5 Q. Could you please describe those situations?

6 A. I don't remember. I just remember it caused
7 mass confusion.

8 Q. Fair enough.

9 So let's take the 2018 election, for
10 example.

11 Did the Gwinnett County Board of Elections
12 have to change procedures for processing voters whose
13 registration was placed in pending status?

14 A. I don't remember.

15 Q. Did the board of elections in 2018 have to
16 make adjustments to procedures for processing
17 absentee ballots?

18 A. Yes.

19 MS. MARKS: Let's take a break...

20 MR. POWERS: That's fair. You want to
21 take a five-minute break and see if we can
22 do something with the thermostat?

23 MR. STEPHENS: All right.

24 MR. POWERS: Go off the record.

25 (Recess from 10:45 a.m. to 10:58 a.m.)

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1 BY MR. POWERS:

2 Q. So before we move on, perhaps, do a little
3 bit of clean up on some questions that I posed to you
4 before the break.

5 Before the break you spoke about moving from
6 the punch card voting system to the optical scan
7 system in 2000.

8 I wanted to ask what general response you
9 received from voters upon the change from the punch
10 card voting system to the optical scan system?

11 A. Initially it was confusion. Anytime you
12 have a change, you have to do public education and
13 voter education. So they were confused to begin
14 with.

15 But the problem we had with that we still
16 continue to have today. When you have a general
17 election, you have a write-in candidate. Say you
18 have voters that want to bubble in Mickey Mouse and
19 then come in and bubble in the write-in space for
20 Mickey Mouse and then write Mickey Mouse's name on
21 it. That is just a continuing problem with that type
22 of ballot.

23 But, again, initially, it was just
24 confusion. And then about the time, you know, we
25 used it for the last election, they were used to it

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1 and then we changed them over.

2 Q. When you say "they were used to it," what do
3 you mean by that?

4 A. We just didn't get as many complaints as we
5 did the first election that we used it for because
6 they had gotten used to -- you know, they knew to
7 bubble in and put it in the scanner and what they
8 were looking for.

9 Q. From an election administration's
10 standpoint, was the optical scan system an
11 improvement over the punch card system that had been
12 employed before?

13 A. I don't know that it was an improvement. It
14 was just a change. You know, of course, with what
15 happened in 2000, we were glad we weren't on punch
16 card. I don't necessarily think it was an
17 improvement. I don't necessarily think it was not an
18 improvement. It was just a change.

19 Q. You had mentioned the write-in issue on the
20 optical scan system. Isn't it true that there's --
21 you can still write in candidates on the current
22 voting system?

23 A. Yes. On the DRE and the optical scan but
24 the DRE won't let you cast an overvote. That's the
25 difference.

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1 Q. I wanted to talk about the spoiling issue
2 that you had mentioned earlier. You had mentioned
3 overvotes.

4 Could you explain to difference between when
5 a voter casts an overvote and other situations in
6 which casting a vote by paper ballot can result in a
7 particular vote getting caught up for some reason?

8 A. Sure. Again, first, there is the overvote
9 and that's when someone votes for more than the
10 number of candidates allowed in a particular race.
11 So if you're only allowed to vote one and you vote
12 two, then it kicks that out. That's considered an
13 overvote.

14 If a voter happens to make a stray mark in
15 the timing marks around the ballot, sometimes that
16 will kick it out. If the ballot isn't printed
17 exactly correctly, if it's just a millisecond
18 issue -- I don't know. I'm not a tech person. But
19 if it's the least bit off, it will not accept the
20 ballot, which would be a broader problem with more
21 ballots, but you can see that as well.

22 If for some reason a ballot was damaged,
23 perhaps, if an absentee ballot, at someone's home
24 they spill coffee or tea on it or if they used
25 Wite-Out ®, the liquid Wite-Out ®, it considers it an

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1 overvote because it reads the metal in the Wite-Out
2 ®.

3 So that's the main things that I remember
4 that we encountered and that we still encounter today
5 with the absentee ballots by mail.

6 Q. When there's an overvote in a particular
7 race and it's -- the optical scanner kicks it out, I
8 believe you said, does the -- do the votes for the
9 rest of the races on that same ballot count?

10 A. It would now only by absentee by mail, but
11 in the polls it would not because the machines are
12 programmed to kick those out. And so the voter would
13 either have to -- like it'd spoil that ballot and
14 lose their vote or get a second ballot and revote and
15 insert it into the machine.

16 Q. What about in cases of -- strike that.
17 What about provisional ballots?

18 A. Well, there wouldn't be overvotes on
19 provisional ballots because those are duplicated by
20 staff. Ninety-eight percent of our ballots are
21 duplicated.

22 Q. Could you briefly explain what the
23 certification process is after an election passes
24 and -- I'll start there.

25 Could you explain the certification process

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1 after an election passes?

2 A. Yes. Once we've received all of the memory
3 cards from the polling locations on election night,
4 all that is aggregated into the GEMS server. We then
5 add in the absentee ballots by mail figures and then
6 the provisional ballots are scanned and they're added
7 in there as well.

8 And once everything has been aggregated into
9 that system, it produces a report and that report is
10 used to certify the election.

11 Q. When you're certifying an election, what is
12 it that you're certifying to?

13 A. That the vote totals from those cards is
14 what was produced on that report.

15 Q. Did you certify the results of all elections
16 conducted while the optical scan system was in place
17 in 2000 and 2001?

18 A. Yes.

19 Q. Earlier you mentioned an issue on -- that
20 had occurred with some of the batteries dying?

21 A. Mm-hmm.

22 Q. I wanted to ask about the batteries that are
23 employed on the optical scanners that are used today
24 to process both absentee and provisional ballots.

25 Do the batteries on those optical scanners

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1 used today for absentee and provisional ballots have
2 the same problem of dying?

3 A. Not on the scale that it did when we had it
4 deployed countywide.

5 Q. What scale does it happen on today?

6 A. Maybe one of every third election. And the
7 reason for that is we change those batteries when
8 we're doing L&A testing.

9 Q. What is it that happens one in every three
10 elections with respect to the batteries in the
11 optical scanners?

12 A. The optical scan unit just doesn't accept
13 the ballot. It just -- it just stops. It's like
14 "I'm done; I'm not doing anything else."

15 Q. Is that on one machine?

16 A. Yes.

17 Q. So in one out of every three elections one
18 battery on one optical scan machine dies; is that
19 fair?

20 A. Right.

21 Q. Let's talk briefly again about municipal
22 elections to the extent that you know, of course.

23 Duluth -- is it fair to say that Duluth,
24 Lawrenceville, Lilburn, Norcross and Peachtree
25 Corners conduct their own municipal elections using

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1 DRE voting machines?

2 A. Correct.

3 Q. Are there any other municipalities in
4 Lawrenceville that conduct elections that you're
5 aware of?

6 A. You mean in Gwinnett?

7 Q. Sorry. Strike that.

8 Are there any other municipalities in
9 Gwinnett County that conduct their own elections that
10 you're aware of?

11 A. Every city within Gwinnett County with the
12 exception of Braselton conducts their own elections.
13 We do not conduct any city elections.

14 Q. Are there any municipalities in Gwinnett
15 County that conduct elections using hand-marked paper
16 ballots?

17 A. I do not know.

18 Q. Do you know what the City of Snellville does
19 with respect to the conduct of its municipal
20 elections and its voting method?

21 A. I do not.

22 Q. Do you know who the points of contact are
23 with the cities that do conduct their elections using
24 the DRE voting machines?

25 A. It's the city clerks, whomever that is at

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1 the time.

2 Q. And that's who the Gwinnett County Board of
3 Elections negotiates the intergovernmental agreement
4 with?

5 A. It's not really a negotiation, but that is
6 the point of contact between our office and the city
7 councils. Yes.

8 Q. Thank you.

9 In Duluth, Lawrenceville, Lilburn, Norcross
10 and Peachtree Corners, do you have any knowledge
11 about the number of polling places that those cities
12 employ?

13 A. One.

14 Q. Do each of those -- strike that.

15 Is it correct that Duluth, Lawrenceville,
16 Lilburn, Norcross and Peachtree Corners all hold
17 at-large elections?

18 A. No. Peachtree Corners has a mayor and three
19 at-large positions and then they have three that are
20 post-district wards. I'm not sure what they call
21 them.

22 Q. Thank you.

23 To make sure I got this right then, so
24 Duluth, Lawrenceville, Lilburn and Norcross hold
25 at-large elections?

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1 A. Correct.

2 Q. Duluth, Lawrenceville, Lilburn and Norcross,
3 they each have one ballot stop?

4 A. I do not know.

5 Q. Do the municipalities have early voting for
6 their elections?

7 A. Yes.

8 Q. How long is that early voting period for?

9 A. I don't know.

10 Q. Have you run any elections in which
11 municipalities are also holding elections or contests
12 on the same day?

13 A. We had county elections with city elections
14 on the same day?

15 Q. Yes.

16 A. Yes.

17 Q. Tell me about how that works in terms of the
18 logistics of getting the ballot and ensuring that
19 those municipal elections are also on the county
20 ballot?

21 A. They are not on the county ballot. We don't
22 conduct city elections, whatsoever. So on those
23 days, voters have two polling locations. They have
24 their county polling location and they have their
25 city polling location. And they have to go to each

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1 one respectively.

2 Q. In those situations where you have a
3 separate municipal and county election on the same
4 day, for Duluth, Lawrenceville, Lilburn and Norcross,
5 is the County Board of Elections still providing DRE
6 machines to the municipalities?

7 A. It depends on the size of the election. If
8 the election is very large and we have to deploy a
9 lot of our equipment, then we do not. If it's a
10 smaller election, for instance, a special election,
11 then we would allow them the use of the equipment.
12 And if not, I do not know what they do.

13 Q. You anticipated my next question.

14 A. Yeah.

15 Q. So is it fair to say that in situations
16 where you -- say, the Gwinnett County Board of
17 Elections has a major election and can't provide
18 voting machines to the municipalities, do you have
19 any knowledge of what the municipalities do in terms
20 of their method of election?

21 A. I do not. And it's very rare that we have
22 so many cities that we can't provide equipment to
23 them. So I really don't know.

24 Q. Do you recall any specific elections in
25 which municipalities requested voting machines and

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1 the Board of Elections was not able to provide them?

2 A. No.

3 Q. When the municipalities conduct early
4 voting, is it the case that each municipality has its
5 own separate early voting location?

6 A. I do not know.

7 Q. Do you know if municipalities hire temporary
8 workers who assist with conducting municipal
9 elections?

10 A. I do not.

11 Q. Let's consider the situation where you're
12 about to conduct an election.

13 Can you please walk me through the steps of
14 how you get the machines ready from the very
15 beginning of getting them out of storage to the end?

16 A. Well, actually, they are not in storage;
17 they are onsite. But we determine the number that
18 we're going to deploy per precinct. Again, that's
19 based on numbers and past voting history for the
20 precinct.

21 We pull out ever how many of numbers that is
22 per precinct. We tag them with that polling
23 location, that precinct number and name. And then
24 they are tested based on the day they are going to be
25 delivered.

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1 We have 11 delivery trucks that deliver for
2 three or four days. And so the precincts are tested
3 by what day their election equipment is going to go
4 out because that helps our rollout.

5 And they go through the process as we
6 discussed, the diagnostics testing, the automatic L&A
7 and in addition to that the -- what we call VWD,
8 which is the sight and hearing keypad. We test to
9 make sure that's correct.

10 In Gwinnett County we have to do a second
11 check because we have our Spanish language that has
12 to be checked as well.

13 Once everything is checked, if everything
14 checks off okay, then that unit is closed and sealed
15 and it gets put on a cart with whatever its truck
16 number is.

17 Then those are delivered to polls prior to
18 election day, then they are unsealed and they use
19 them.

20 Q. That's a lot.

21 A. It is.

22 Q. So, perhaps, we should back up for a second.

23 Let's take just the designing of the ballot
24 piece. Can you take me through the process by which
25 the ballot is essentially designed and then loaded

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1 onto the DRE machines?

2 A. Well, the ballot itself is designed by the
3 State. The information that we provide is anything
4 local, which would be our local candidates, and any
5 questions that we may have.

6 Once that is completed -- again, we're
7 unique. So the State sends it back to us. We have
8 to send it out for translation. Once all that takes
9 place, then we go through and we do what we call
10 "proof the ballots." We ensure that the correct
11 ballot styles are appearing at the correct precinct
12 with the precinct number.

13 Q. You mentioned that the ballot was -- is
14 designed by the State?

15 A. Correct.

16 Q. How is the ballot actually transmitted from
17 the State to you?

18 A. They put it onto -- I'm not going -- they
19 put it onto something electronic. I'm not sure. And
20 it's sealed at the State.

21 We have to go down and physically sign for
22 that file. Again, it's in a sealed bag and we bring
23 it back to our office.

24 Q. Has that always been the system since the
25 DRE voting system has been in place?

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1 A. No. Prior to that, I believe, it was
2 electronic transmission.

3 Q. Mm-hmm. And let's talk about that.

4 First, when was the switch made from the
5 electronic transmission to the current system of
6 physically going and picking it up?

7 A. I don't remember.

8 Q. Five years ago?

9 A. It's been within the last five years.

10 Q. That's helpful.

11 Please describe to me what the -- how the
12 electronic transmission of the ballot was completed.

13 A. Before the switch or...

14 Q. Before the switch, yes. Thank you.

15 A. It was put onto a CD and we would go and
16 pick it up and bring it back to the office. So it
17 wasn't a sealed bag like it is now.

18 Q. Mm-hmm. And after the election is over,
19 what would you do with that CD?

20 A. With the ballot layout on it?

21 Q. Yes.

22 A. I don't remember.

23 Q. Okay. Now, let's shift from the ballot
24 design to the electronic poll books.

25 How long have electronic poll books been

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1 used in Gwinnett County?

2 A. Since 2002.

3 Q. How would -- strike that.

4 What's the process by which the information
5 would get loaded onto the electronic poll books?

6 A. How would it get loaded into the electronic
7 poll books? We would receive a file from the State.
8 And then we put it onto a memory card. And then we
9 insert the memory card into the express poll unit.

10 Q. How do you currently receive -- well, strike
11 that.

12 First, what's the file that you receive from
13 the State?

14 A. It's called the -- it's just called the
15 "voter file," yeah. Bulk update file.

16 Q. Got it.

17 And how would -- now under the current
18 system, how do you currently receive the bulk update
19 from the Secretary's office?

20 A. I don't know because it has changed as well
21 and I don't know how we get it now.

22 Q. Do you recall how the Secretary transmitted
23 the bulk update before the current system?

24 A. I believe it was a secured FTP site.

25 Q. Could you please tell me more about how the

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1 bulk update was transmitted through the secured FTP
2 site?

3 A. No because I wasn't involved in that
4 process.

5 Q. Who was involved in that process?

6 A. Multiple staff members.

7 Q. Do you recall any of their names?

8 A. The same three I gave you earlier are the
9 main three.

10 Q. Just to make sure I understand it at sort of
11 the broadest level, tell me if I have this right.

12 So essentially the Secretary -- is it fair
13 to say the Secretary of State -- wait, it wouldn't be
14 the Secretary of State's Office necessarily. I might
15 be wrong about that.

16 When the Kennesaw CES was in place, were you
17 receiving the bulk update from the Kennesaw Center
18 for --

19 A. -- Election Systems.

20 Q. Thank you. When the Kennesaw Center for
21 Election Systems was in place, were you receiving the
22 bulk update from the Kennesaw Center for Elections
23 Systems?

24 A. I believe that's correct.

25 Q. Is it fair to say that the Kennesaw Center

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1 for Election Systems would post the bulk update on a
2 secure FTP site and then someone with the Gwinnett
3 County Board of Elections would download the bulk
4 update from the FTP site?

5 A. Yeah.

6 MR. TYSON: Uh... okay. Fine. You
7 already answered. That's fine.

8 BY MR. POWERS:

9 Q. Do you recall how long that process was in
10 place for?

11 A. I do not.

12 (Plaintiff's Exhibit 8 was marked for
13 identification.)

14 MR. POWERS: I'm going to hand you what
15 I'm marked for identification as Plaintiff's
16 Exhibit 8.

17 Copies for everyone. There's three
18 here.

19 BY MR. POWERS:

20 Q. Have you had a chance to look it over?

21 A. Mm-hmm.

22 Q. Ms. Ledford, what is Plaintiff's Exhibit 8?

23 A. It looks like something from Kennesaw State
24 or someone saying how the voter files are put out
25 there -- or the -- yeah -- oh, I'm sorry -- ballot

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1 file for ballot proofing, yeah.

2 Q. You mentioned ballot proofing. Again, help
3 me understand. Does that -- so talking about
4 Plaintiff's Exhibit 8, are the contents of the files
5 described in Plaintiff's Exhibit 8 relevant to the
6 formatting of the ballot, the bulk update for the
7 electronic poll books or both?

8 MR. TYSON: I'm going to object that we
9 lack foundation for where we are. Has she
10 seen this document before? Has she relied
11 on this document. If we can lay some
12 foundation before we get into that.

13 MR. POWERS: Sure.

14 BY MR. POWERS:

15 Q. Yeah. So Ms. Ledford, have you seen
16 Plaintiff's Exhibit 8 before?

17 A. No.

18 Q. Have you seen documents similar to
19 Plaintiff's Exhibit 8 before?

20 A. No.

21 Q. Who from the Gwinnett County Board of
22 Elections would have been receiving these kinds of
23 files from the Secretary?

24 A. Kelvin Williams and Kristi Royston.

25 Q. Got it. So if communications were coming

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1 from the Secretary or from the Kennesaw Center for
2 Elections Services, they probably would have been
3 going to Kelvin or -- Kelvin Williams or Kristi
4 Royston?

5 A. Well, they would not have been going to
6 them. They would have been made aware that they were
7 out there and available for them to retrieve.

8 Q. Are you familiar with the types of files
9 that are listed in Plaintiff's Exhibit 8?

10 A. I know what they are talking about. I've
11 never actually seen them.

12 Q. Let's talk about -- let's turn to the second
13 page.

14 In particular, let's talk about the third
15 item listed here which I will call Cherokee County,
16 slash, express poll, slash, ED file, slash November
17 2016 general election dot zip. Do you see that?

18 A. Mm-hmm.

19 Q. Do you see where it says that this is not a
20 file posted for each county? This file is only
21 posted to those counties who produce the storage
22 media into the jurisdiction's express polls
23 themselves. Counties that do this operation are
24 Fulton, Cobb, DeKalb, Gwinnett, Forsyth, Chatham,
25 Henry, Columbia, Clayton and Cherokee.

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1 Do you see that?

2 A. Yes.

3 Q. Would you mind explaining to me in layman's
4 terms what this -- what this is in terms of producing
5 the storage media and loading it into the express
6 polls?

7 A. No --

8 MR. TYSON: Object again on foundation.
9 I don't think we've established that she
10 knows what this process is referring to
11 before you get into details of it.

12 MR. POWERS: Yeah, no, that's fair.
13 Perhaps, we should go through some of these
14 and talk about them individually.

15 BY MR. POWERS:

16 Q. Let's start with -- on the first page, the
17 very first one, Appling County, slash, proof, slash,
18 audio, slash, Appling audio.

19 Is that a file that Gwinnett County uses?

20 A. Yes.

21 Q. What is that file?

22 A. It is the file that is used for the --
23 what's called the VWD, which is voters with
24 disability. This is the ballot that has been
25 recorded for use with that piece of equipment.

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1 Q. That's something that Gwinnett County uses?

2 A. Yes.

3 Q. Let's move down one.

4 Do you see where Plaintiff's Exhibit 8 lists
5 the file Appling County, slash, proof, slash, ballot,
6 slash, 01, dash, Appling dot zip?

7 A. Yes.

8 Q. What is that file?

9 A. That's the ballot proofing file.

10 Q. Again, would you mind explaining in layman's
11 terms what the ballot proof is?

12 A. Yes. We actually print out every possible
13 ballot style within Gwinnett County and we ensure
14 that everything on that ballot is correct; that the
15 districts are correct, that the spelling is correct,
16 the titles are correct and the instructions for the
17 voter -- vote for one, vote for two -- we ensure all
18 that information is accurate.

19 Q. Is that proof -- strike that.

20 Is that ballot proof just for paper ballots
21 or for the DRE machines as well?

22 A. I don't know. I can't remember.

23 Q. Is that ballot proof for the DRE voting
24 machines?

25 A. I don't know.

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1 Q. Turning back to the Appling County proof
2 ballot 01 Appling dot zip file, is that a file that
3 the Gwinnett County Board of Elections uses?

4 A. Yes.

5 Q. Let's skip down a little bit to the third
6 one from the bottom. So we're skipping one. The
7 file that says, Appling County, slash, express poll,
8 slash number list 001, in parenthesis 11-08-2016 dot
9 PDF?

10 A. Mm-hmm.

11 Q. What is that file?

12 A. That's the number list of voters. And what
13 that is is a list of people who voted at each
14 precinct, not in, you know, any kind of order, just
15 who voted.

16 Q. Does Gwinnett County use that file?

17 A. We do.

18 Q. Let's turn back to the second page. I guess
19 it would be right in the middle there.

20 Do you see the copy that -- strike that.

21 Do you see the file that's listed Clayton
22 County, slash, GEMS DB, slash, asterisk, asterisk,
23 asterisk dot GBF?

24 A. Yes.

25 Q. What is that file?

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1 A. I have no idea.

2 Q. Moving to the second from the bottom, do you
3 see the file listed as Richmond County, slash, GEMS
4 DB, slash, 2 period GEMS instructions dot PDF?

5 A. Yes.

6 Q. What is that file?

7 A. According to this, this is a manual on GEMS
8 operation. I do not -- I have not seen that.

9 Q. So considering Plaintiff's Exhibit 8 as a
10 whole, is it fair to say that several files are
11 listed in Plaintiff's Exhibit 8 that the Gwinnett
12 County Board of Elections uses?

13 A. Yes.

14 Q. Are these files that the Gwinnett County
15 Board of Elections received at some point from the
16 Kennesaw Center for Election Services?

17 MR. STEPHENS: If you know.

18 THE WITNESS: I just want to make sure
19 there was no objection to that one.

20 MR. TYSON: You're fine.

21 THE WITNESS: Yes.

22 MR. POWERS: Perhaps, we can have the
23 court reporter read back the question.

24 (Whereupon, the record was read back as
25 follows:

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1 Q. Are these files that the Gwinnett
2 County Board of Elections received at some
3 point from the Kennesaw Center for Election
4 Services?)

5 THE WITNESS: Yes.

6 BY MR. POWERS:

7 Q. Were these files received from the FTP
8 server that Kennesaw Center for Election Services
9 used?

10 A. I could not confirm that.

11 Q. Ms. Ledford, do you currently still receive
12 many of the files that are listed in Plaintiff's
13 Exhibit 8?

14 A. Correct, yes.

15 Q. Whom do you currently receive the files
16 from?

17 A. The Secretary of State's Office.

18 Q. Do you receive those files in person through
19 the means -- strike that.

20 Remind me again how you receive the files
21 listed in Plaintiff's Exhibit 8 from the Georgia
22 Secretary of State's Office?

23 A. I couldn't tell you how we receive all of
24 those. I just know there are certain ones that --
25 they let us know they are ready. We personally go

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1 down. And we pick them up in a sealed container and
2 unseal them once they are in our office.

3 Q. Thank you.

4 All right. Let's turn back to talking about
5 absentee ballots.

6 Running an absentee ballot program in a
7 county the size of Gwinnett County is a complicated
8 operation. Would you agree?

9 A. Yes.

10 Q. Many voters -- strike that.

11 Is it fair to say that there are many
12 absentee ballots cast in Gwinnett County elections?

13 A. Yes.

14 Q. Do you recall approximately how many
15 absentee ballots were cast in the November 2018
16 general election?

17 A. Approximately 18,000.

18 MR. POWERS: In fact, I'm handing you
19 what I'm marking for identification as
20 Plaintiff's Exhibit 9.

21 (Plaintiff's Exhibit 9 was marked for
22 identification.)

23 BY MR. POWERS:

24 Q. Maybe we could just go through Plaintiff's
25 Exhibit 9 briefly.

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1 First, what is Plaintiff's Exhibit 9?

2 A. It is the certified election results from
3 the November 6, 2018 general election.

4 Q. Could you explain briefly what the certified
5 general elections results are?

6 A. Sure. This is a listing of all the
7 candidates and issues that appeared on the ballot.
8 It gives you the name, the party, if it was a party
9 official. It gives you the results of the polling
10 location from election day, absentee by mail,
11 absentee -- I'm sorry -- advanced voting in person
12 and then provisional ballots that were tabulated for
13 these races.

14 Q. You anticipated my question.

15 So, yeah, if you wouldn't -- so in the
16 middle of the document, it looks like there are five
17 columns: polling, ABM, AIP, AIP2, PRO -- P-R-O --
18 and total.

19 And if you wouldn't mind just taking me
20 through those columns and explaining what they mean.

21 A. Sure. Polling is the votes that were cast
22 at the polling location on election day exclusively.

23 Absentee by mail is all the absentee ballots
24 that were received in the office and tabulated.

25 AIP and AIP2 are advance in-person location.

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1 That's broken down into two columns because the GEMS
2 server will only recognize 99 units for one vote
3 center and we have over a hundred. So that's broken
4 down into two; nothing specific in either one of
5 those.

6 Provisional is the number of provisional
7 ballots that were cast and tabulated for those races.

8 Q. Which of the columns listed in Plaintiff's
9 Exhibit 9 are cast on DRE voting machines?

10 A. Polling, AIP1 and AIP2.

11 Q. Is it fair to say that the ABM and PRO, or
12 provisional ballot columns, are cast using
13 hand-marked paper ballots?

14 A. Correct.

15 Q. I'd like to just briefly run through a
16 couple of the election totals starting with governor.

17 In particular in the governor's election in
18 2018, how many total votes did the three candidates
19 for governor receive?

20 A. Individually you mean?

21 Q. Yes.

22 A. Okay. Brian Kemp 132,998. Stacey Abrams,
23 one thousand -- I'm sorry -- 178,097. Metz 30,892.
24 And then 196 write-in votes.

25 Q. Thank you.

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1 A. Mm-hmm.

2 Q. Can you please do the same for the 2018
3 lieutenant governor's election in Gwinnett County?

4 A. Yes. Jeff Duncan 132,992. Sarah Amico
5 170,229. And then write-in votes 299.

6 Q. Thank you. And can you please do the same
7 for the 2018 Secretary of State election in Gwinnett
8 County?

9 A. Yes. Brad Raffensperger 130,813. John
10 Barrow 172,213. Duval 8,634. And 127 write-ins.

11 Q. Thank you.

12 Can you please do -- we're going to skip one
13 and if you could please do the same for me for the
14 commissioner of agriculture race in 2018 in Gwinnett
15 County.

16 A. Yes. Black 140,219. Swan 168,343. And 247
17 write-ins.

18 Q. Thank you.

19 And then if we can turn to the next page, if
20 we could turn -- looking in the middle of the page,
21 if you wouldn't mind doing the same for me for the
22 commissioner of labor race in 2018 in Gwinnett
23 County.

24 A. Butler 138,912. Keatley 170,286. One
25 hundred and fifty-two write-ins.

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1 Q. Thank you.

2 A. Mm-hmm.

3 Q. All right. Let's talk about absentee
4 ballots.

5 Would you mind taking me through, again,
6 from the beginning to the end, the process by which
7 paper ballots are designed, created and disseminated
8 to Gwinnett County voters?

9 A. Yes. They are created by the Secretary of
10 State's Office in conjunction with us providing the
11 local information. They create it. They send us the
12 ballot proof. We proof it. And then we receive a
13 file -- a file is credited. We create and print --
14 don't create. I apologize. We print our own ballots
15 based on need and we mail them to the voters.

16 Q. When you're creating the absentee ballot,
17 does -- strike that.

18 What role does the GEMS database play in
19 creating the ballot?

20 A. I couldn't say from the Secretary of State's
21 Office. We receive the ballot, we put it into it and
22 it aggravates the vote totals.

23 Q. Is the Gwinnett County Board of Elections
24 proofing the GEMS database?

25 A. Yes.

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1 Q. Describe to me that proofing process that
2 the GEMS database --

3 A. The file that was described in Exhibit 8, we
4 receive that file. And then we print out all of
5 those ballots and they are manually checked by two to
6 four people depending on the size of the ballot.

7 Q. For the sake of the record, can you identify
8 the file in Plaintiff's Exhibit 8 that you're
9 referring to?

10 A. No. It's not me that does it, so...

11 Q. Fair enough. I wouldn't be able to identify
12 it either.

13 So then -- but it's your belief that it's
14 one of the files that is listed in Plaintiff's
15 Exhibit 8?

16 A. I couldn't say that because I'm not familiar
17 with the file, so I don't want to speculate.

18 Q. Who at the Gwinnett County Board of
19 Elections is proofing the database?

20 A. Kristi Royston is the lead and then she
21 chooses the people that work with her on that.

22 Q. Do you know how she goes about proofing?

23 A. I don't.

24 Q. You had mentioned -- strike that.

25 Does the proofing include the Spanish

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1 language?

2 A. It does.

3 Q. Who is doing the proofing of the Spanish
4 language portion?

5 A. Staff members, different ones.

6 Q. Would the staff members have to know Spanish
7 to proof the Spanish language portion of the --

8 A. Yes.

9 Q. Remind me again, so once you've gotten the
10 proof back from the secretary, what happens next?

11 A. Well, we go through. We have them make any
12 corrections if there are any. We reproof, so we may
13 proof one ballot several times depending on what the
14 errors or corrections need to be.

15 Once everything is in order, then we sign
16 off on that ballot. And that lets them know that
17 everything is good to go for that ballot.

18 Q. When this proofing takes place, is it a
19 separate process for absentee ballots and the ballot
20 that's displayed on DRE machines or is it the same
21 thing?

22 A. I don't know.

23 Q. Does Kristi Royston conduct the proofing
24 process to see that only the voters casting ballots
25 on DRE machines can -- strike that.

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1 Does Kristi Royston proof the ballot that
2 appears on DRE voting machines to ensure that voters
3 can vote only for the contest that they are eligible
4 to vote for?

5 A. I'm not really -- I'm a little confused.

6 MR. STEPHENS: You may need to restate
7 the question.

8 MR. POWERS: So let's take for
9 example -- I'm going mark this as
10 Plaintiff's Exhibit 10.

11 (Plaintiff's Exhibit 10 was marked for
12 identification.)

13 BY MR. POWERS:

14 Q. Ms. Ledford, what is Plaintiff's Exhibit 10?

15 A. This is the election summary report for the
16 presidential preference primary from March 1st of
17 2016.

18 Q. How many contests are on the election
19 summary report for the presidential preference
20 primary?

21 A. Two.

22 Q. What contests are those?

23 A. Republican presidential potential candidates
24 and Democratic presidential potential candidates.

25 Q. Were there any other presidential elections

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1 or contests on the ballot on March 1st, 2016?

2 A. No.

3 Q. Will Gwinnett County be conducting a
4 presidential preference primary on March 24, 2020?

5 A. Yes.

6 Q. And will there be -- strike that.

7 For the March 24, 2020 presidential primary,
8 will the Republican and Democratic primaries be on
9 the ballot?

10 A. Yes.

11 Q. For president?

12 A. Yes.

13 Q. Will any other races be on the ballot?

14 A. Not to my knowledge, but that's a special
15 election date, so it's possible that other things can
16 appear on that ballot.

17 Q. Say Kristi Royston is proofing the ballot
18 for a presidential preference primary, is she
19 proofing the ballot to ensure, for example, that
20 voters casting ballots on DRE machines in a
21 Republican primary election will only see the
22 Republican candidates on their ballot and not
23 Democratic candidates?

24 A. Yes.

25 Q. How would she go about doing that?

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1 A. I don't know her procedure for that.

2 Q. Similarly, for any primary elections, she
3 would proof the ballots and make sure that voters
4 casting a ballot in a particular party's primary
5 would only see candidates for that party's primary?

6 A. Yes.

7 Q. Now, let's talk about some of the logistics
8 related to the printing of the paper ballots.

9 You decide how many paper absentee ballots
10 to print for a particular election?

11 A. We don't preprint. It's based on need. So
12 if we get in 25 applications that day, we print out
13 those 25 ballots and mail those.

14 Q. Let's consider provisional ballots.

15 How do you decide how many provisional
16 ballots to print for a particular election?

17 A. Based on history and anticipation of the
18 election. So it varies. It could be 1.5 percent.
19 It could be one percent of the total active
20 registered voters for a polling location.

21 Q. How do you disperse those provisional
22 ballots between, for example, different early voting
23 locations?

24 A. Well, early voting is a little different.
25 Early voting gets a standard number. They get, for

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1 instance, five of every ballot style. Now, sometimes
2 it may only be two. It may be 10. It depends on the
3 elections that we're having, but they get every
4 ballot style because any voter in the county can go
5 to one of our satellite locations.

6 Q. Mm-hmm. Roughly -- strike that.

7 Do you have a sense of how many provisional
8 ballots the early voting location centers might
9 receive?

10 A. No.

11 Q. Now, let's turn to election day.

12 How many provisional ballots will be sent to
13 particular polling places?

14 A. Again, it depends. It's whatever the
15 election is and what we feel the anticipation is. It
16 could be one percent. It could be three percent.
17 There's no -- there's no -- it's kind of a sliding
18 scale depending, again, on the election itself.

19 Q. Has there ever been a situation in which a
20 polling place has run out of provisional ballots?

21 A. No.

22 Q. How much does it cost to print paper
23 ballots?

24 A. It's 55 cents per page.

25 Q. How long does it take for the printer to

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1 turn around a print order once you give it to them?

2 A. I don't know.

3 Q. Does the price of printing paper ballots
4 depend on the type of printer that's used?

5 A. No. We have Ballot On Demand. We have our
6 own printers and it's 55 cents a page regardless.

7 Q. Got it. So for Ballot On Demand printers,
8 the cost is 55 cents per page?

9 A. Correct.

10 Q. Do you know what the cost per page is on
11 other types of printers?

12 A. You're talking from other vendors?

13 Q. (Counsel nods head affirmatively.)

14 A. No. I don't remember.

15 Q. Let's consider the whole absentee ballot
16 process sort of from the beginning.

17 How long in advance do you need to know what
18 the ballot style is to be able to get them printed in
19 time to conduct the absentee ballot process?

20 A. I'm sorry. Can you say that question again?

21 Q. Sure. I'll say it a little more simply.

22 How long before an election do you need to
23 start preparing for the absentee balloting process?

24 A. Well, we vote -- whatever the beginning
25 deadline is for that because we have -- depending on

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1 the type of ballot, the -- a voter can request a
2 ballot 180 days prior to election and by law we have
3 to start issuing 40 to 45 days depending upon when
4 you can get the ballot ready.

5 So we would need to have it a couple of
6 weeks -- have it ready to go a couple of weeks prior
7 to that so that we would have a chance to get it
8 loaded and, like you said, to start printing the
9 provisional ballots as well.

10 Q. So let's --

11 A. Six weeks before election.

12 Q. Let's take, for example, the upcoming March
13 presidential primary.

14 A. Mm-hmm.

15 Q. If an election -- if the election day itself
16 is March 24th, you would need six weeks before that
17 to start preparing?

18 A. Minimum.

19 Q. I think we've touched on this a little bit
20 already, but could you help explain to me how the
21 Gwinnett County Board of Elections ensures that when
22 a voter requests an absentee ballot, that the right
23 ballot style is sent to him or her.

24 A. Well, with Ballot On Demand, it works with
25 the election net system. And so the staff during the

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1 day will go in and enter everyone who has requested a
2 ballot. They would enter any edits that go with that
3 ballot, meaning over 75 military -- you know,
4 disabled.

5 And at some point during the day, they take
6 that file and they load it into the ballot printing
7 file. And because it's coming directly from ENet,
8 that knows what ballot style to print for that voter
9 and it even prints out with the voter's name on the
10 stub at the top so that when staff members start
11 putting that ballot packet together, they know that
12 they've got John Brown's absentee application, then
13 they have John Brown's ballots and John Brown's
14 labels for his ballot packet.

15 Q. Have you found this process to be effective
16 in terms of making sure that voters are getting the
17 right ballot?

18 A. Yes. It's been much more efficient than the
19 way that we did it previously.

20 Q. Do you know what the error rate is with
21 respect to voters receiving the wrong ballot style in
22 their paper absentee form?

23 A. I would have to say it's very minimum --
24 very, very minimal because I don't get complaints
25 about that usually.

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1 Q. Could you describe in a little bit more
2 detail for me how the Ballot On Demand system
3 interacts with ENet?

4 A. I really can't. I'm not the tech person in
5 that. I know -- I'm the user, so I know it goes from
6 here to there, but I don't know the process itself
7 because I've never been a part of that. I've seen
8 it, but I've never actually done it.

9 Q. Sure. And who kind of takes the lead on the
10 tech side in terms of that process?

11 A. Our voter registration team.

12 Q. Mm-hmm. And remind me again who leads the
13 voter registration team?

14 A. Well, you haven't heard that name. It's
15 Shantell Black.

16 MR. POWERS: All right. Well, perhaps,
17 now would be an okay time to break for
18 lunch.

19 THE WITNESS: Oh, sure.

20 MR. POWERS: Go off the record.

21 (Recess from 12:04 p.m. to 1:04 p.m.)

22 BY MR. POWERS:

23 Q. Before the break, Ms. Ledford, we were
24 talking about the DRE machines and the testing that
25 was done. And you mentioned that the Gwinnett County

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1 Board of Elections tests all the voting machines; is
2 that correct?

3 A. The ones that are going to be used.

4 Q. On election day and during early voting?

5 A. Yes.

6 Q. The testing of the DRE machines is
7 documented by your office; is that correct?

8 A. Yes.

9 Q. Roughly speaking, how long does it take to
10 test a DRE machine?

11 A. Depends on the length of the ballot. It's
12 takes anywhere from half a minute to a minute to
13 maybe five or six.

14 Now that we have a Spanish language, it
15 takes a little bit longer. It just depends on the
16 length of the ballot. It depends on the person
17 that's doing the testing, you know, how quick they
18 are and different factors.

19 Q. Mm-hmm. So with the Spanish language now on
20 the ballots, is that range of a minute to five
21 minutes, roughly speaking, increased or --

22 A. Yeah because it's double. Because whatever
23 you do in English, you then have to turn around and
24 do in Spanish. It takes us on average four to five
25 weeks to do all of our testing.

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1 Q. Four to five weeks?

2 A. Mm-hmm.

3 Q. How many employees are you involved in the
4 -- strike that.

5 How many employees are part of the testing
6 of those machines during the four- to five-week
7 period?

8 A. Again, it depends on the number that we're
9 doing. Usually, it's a minimum of seven to eight
10 with a maximum of up to 20 to 25.

11 Q. How many times has -- strike that.

12 Are you aware of any instances in which the
13 logic and accuracy testing caught any errors or
14 mistakes on the DRE machines?

15 A. No.

16 Q. If the logic and accuracy testing had caught
17 any errors or mistakes on the DRE machines, would you
18 have been made aware of that?

19 A. Yes.

20 Q. Well, do you test the optical scanner in any
21 way as part of the logic and accuracy testing of the
22 DRE machines?

23 A. Yes. I think we discussed that earlier.
24 Yes.

25 Q. From the beginning of the process, what is

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1 the chain of custody for the voting machines as
2 they're brought out of storage and tested and put
3 into the polling places?

4 A. They -- there is a form. And whoever
5 receives it at the polling location signs that chain
6 of custody. They get a copy and then we bring a copy
7 back for our records.

8 Q. Are there county employees at the individual
9 or early voting locations and polling places who
10 receive the DRE machines or does it tend to be
11 individuals working at, say, the local library or the
12 school --

13 A. It's whoever the contact at the facility is,
14 yeah.

15 Q. So let's take a hypothetical where a voting
16 machine is tested and is being sent to an elementary
17 school.

18 Is it generally the policy that the Board of
19 Elections is responsible for delivering the voting
20 machines to the elementary school?

21 A. Correct.

22 Q. And then an employee or point of contact
23 with the elementary school would sign a form with the
24 county official who's delivering the machine to say,
25 I'm receiving the DRE machine and taking custody of

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1 it?

2 A. Correct.

3 Q. How far in advance of the election would
4 this change chain of custody occur?

5 A. We start delivering the Wednesday prior to
6 the election and we finish up on Monday.

7 Q. Tell me about the time frame for delivering
8 DRE machines to early voting locations.

9 A. Those are delivered on the Saturday before
10 they start because -- or Friday or Saturday depending
11 on whether they are starting on Saturday or Sunday.

12 Q. Tell me about the chain of custody with
13 respect to the memory cards that are eventually
14 inserted into the DRE machines.

15 A. Well, that -- the machine -- it's already in
16 the machines when they are delivered. When we do the
17 L&A testing, they are put in there at that time and
18 they are sealed. And then it gets delivered. The
19 poll workers don't insert that; that's already done.

20 Q. Got it. Make sure I understand it
21 correctly.

22 Going back to our hypothetical with
23 delivering the voting machines to the elementary
24 school, is it fair to say it's the policy of the
25 Gwinnett Board of Elections when voting machines are

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1 delivered to the elementary school, that the memory
2 cards are actually inserted in the voting machines at
3 the time of delivery?

4 A. No. They are inserted during L&A testing.
5 That's what you're testing is that memory card. So
6 once the testing has been completed, then the unit is
7 sealed with a number seal.

8 The side door is closed and locked and then
9 the unit itself is sealed with a number seal.

10 Q. And remind me again. Is that logic and --
11 L&A testing, does that L&A testing occur before the
12 DRE machines are delivered to the elementary school
13 or after they are received by the folks at the
14 elementary school?

15 A. No. All the L&A is done prior to the
16 delivery of the equipment.

17 Q. Got it. So let me make sure I understand
18 this right.

19 When the voting machines are received at the
20 elementary school, are the memory cards in the DRE
21 machines at that time?

22 A. Yes.

23 Q. Would that be true both for machines that
24 are used for early voting and for DRE machines that
25 are used on election day?

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1 A. Yes.

2 Q. When is the next stage in the process, once
3 the machines are delivered, at which point the Board
4 of Elections or any election official or poll worker
5 is involved, again, with respect to getting the DRE
6 machines ready or tested?

7 A. Well, everything is already tested prior to
8 that. So at six o'clock on election morning, they
9 open up the machines and it automatically runs their
10 zero tape. And that lets them know that starting on
11 that day there have been no votes cast on that unit.

12 Q. Is --

13 (Witness conferring with counsel.)

14 MR. POWERS: I'm sorry.

15 THE WITNESS: I'm sorry.

16 MR. POWERS: You want to take a second?

17 (Discussion ensued off the record.)

18 BY MR. POWERS:

19 Q. So to go back to the hypothetical we were
20 talking about before, the voting machines have been
21 received by the elementary school sometime between
22 the Wednesday and the Monday before election day?

23 A. Mm-hmm.

24 Q. And is it fair to say that there's no
25 further testing on the DRE machines or the memory

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1 cards between when they arrive at the polling site
2 and when election day opens or before election day
3 opens at around 6:00 a.m.?

4 A. Correct.

5 Q. Now, let's talk about what happens with the
6 DRE machines after the election is over.

7 Can you please take me through what happens
8 after the polls close and -- strike that.

9 Let's -- if you wouldn't mind just telling
10 me what happens with the DRE machines once the polls
11 close on election day.

12 A. Once they close, the poll workers insert a
13 supervisor card and they do a code. And that causes
14 the unit to start printing out the election results.

15 And each unit prints out three results.
16 While that's going on simultaneously, numbers are
17 being taken off the express poll.

18 Everything has a recap sheet. There's a DRE
19 recap sheet where the information is record. There's
20 an express poll recap sheet where everything is
21 recorded.

22 When that's done, they will pack all of that
23 up. The memory cards are taken out of each unit.
24 They are put into a sealed bag. The sealed bag along
25 with some other items are brought back to the

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1 Elections Office on election night and there they are
2 unsealed.

3 Q. What happens after they are unsealed?

4 A. That's done at the main office and that's
5 when we start downloading the election results and
6 aggregating it into the GEMS server.

7 Q. Ms. Ledford, I'm handing back to you what we
8 previously marked for identification as Plaintiff's
9 Exhibit 3.

10 A. Mm-hmm.

11 Q. And what is Plaintiff's Exhibit 3?

12 A. It's the number of provisional ballots that
13 were tabulated for the November 6, 2018 general
14 election.

15 Q. And does it say -- sorry.

16 Does Plaintiff's Exhibit 3 say how many of
17 those provisional ballots were counted and partially
18 counted and not counted?

19 A. Correct.

20 Q. How many provisional ballots were not
21 counted in the November 2018 election in Gwinnett
22 County?

23 A. Five hundred and sixty-four.

24 Q. How many were partially counted?

25 A. One thousand seven hundred eighty-five.

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1 Q. And how many were -- strike that.

2 How many provisional ballots were completely
3 counted in Gwinnett County in the November 2018
4 election?

5 A. Four hundred thirty-one.

6 Q. Thank you.

7 Ms. Ledford, are all of these provisional
8 ballots hand-marked paper ballots?

9 A. Correct.

10 Q. And they are counted using optical scanners?

11 A. Correct.

12 Q. Ms. Ledford, does Gwinnett County have an
13 intake process with respect to receiving election
14 complaints from voters?

15 A. Yes.

16 Q. Could you please describe it to me?

17 A. It's actually one of the exhibits we
18 provided to you. At all of our polling locations we
19 provide comments and concerns forms. And that allows
20 the voters to get information directly to us.

21 Q. Is that Plaintiff's Exhibit 4?

22 A. Yes.

23 Q. Could you please take me through the --
24 well, strike that.

25 Does Plaintiff's Exhibit 4 consist of

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1 individual voter complaint intake forms filled up by
2 voters that -- sorry -- strike that.

3 Plaintiff's Exhibit 4 consists of voter
4 complaint intake forms from the November 2018
5 election?

6 A. Yes.

7 Q. Are these forms made available at all
8 polling places and early voting locations in Gwinnett
9 County?

10 A. Yes.

11 Q. What are the circumstances in which a voter
12 complaint intake form might be filled out?

13 A. Anytime they feel like anything was not
14 handled appropriately. If they feel like there was a
15 problem with their voting machine, if they felt there
16 was a problem with an absentee ballot. Some people
17 don't like having to cast a provisional ballot.

18 It's just a myriad of any -- a lot of times
19 misinformation that a citizen has received. They'll
20 go to a polling place. It confuses them. So then
21 they write a letter and provide this information.
22 And, of course, then we give them the information
23 they need, so they understand. So it's all over the
24 place.

25 Q. Is it the policy of the Gwinnett County

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1 Board of Elections to respond --

2 A. It is.

3 Q. -- to each voter's complaint?

4 A. Yes.

5 Q. Why don't we go through some of the
6 individual --

7 (Witness confers with counsel.)

8 MR. STEPHENS: We see that there needs
9 to be a further redaction of that exhibit to
10 comply with statutory requirements. So
11 maybe at the end of this deposition we can
12 do that.

13 MR. POWERS: That works for us and,
14 well -- what is the category of information
15 that we need to be redacting?

16 MR. STEPHENS: Phone numbers and --

17 THE WITNESS: Some of them have E-mail
18 addresses?

19 MR. POWERS: Phone numbers and E-mail
20 addresses?

21 MR. STEPHENS: Yes.

22 MR. POWERS: Is it okay if we proceed
23 with questioning of the document that will
24 not involve any personal identifiable
25 information?

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1 MR. STEPHENS: Yes, sir.

2 MR. POWERS: Great. And, I think,
3 redacting the pieces of information
4 afterwards is fine.

5 MR. STEPHENS: All right.

6 BY MR. POWERS:

7 Q. I should have asked. Does the Gwinnett
8 County Board of Elections also have an E-mail address
9 which voters sometimes E-mail with complaints?

10 A. Not specifically. We have several different
11 E-mail addresses and various things will come through
12 all of those but not one specifically for complaints.

13 The form itself is on the website and it has
14 the information about scanning it back to -- I think
15 it's the voterregistration@GwinnettCounty.com. So
16 they'll scan those back in, but we don't usually get
17 just a straight complaint through the E-mail address.

18 Q. Got it.

19 To make sure I understand it correctly,
20 voters will take these voter complaint forms like
21 those in Plaintiff's Exhibit 4 with them from the
22 polling place. After they vote, they fill them out
23 and then they return them essentially per the
24 instructions on the form.

25 A. Correct. And it's also on the website. So

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1 sometimes they'll do that because they can actually
2 type the information in rather than handwriting it.

3 Q. Got it.

4 So if you wouldn't mind taking me through
5 the individual voter complaints that you provided in
6 Plaintiff's Exhibit 4, again, not providing any of
7 the personally identifiable contact information but
8 providing the name of the voter and the type of
9 problem that they experienced and, perhaps, starting
10 with the first page of Plaintiff's Exhibit 4.

11 A. You said you wanted the voter's name?

12 Q. Yes.

13 A. Maury -- something -- Johnson Mike. I can't
14 read their handwriting.

15 This particular voter stated that prior to
16 her casting her ballot, when she was looking at her
17 summary screen, that the card popped out and she did
18 not get to push the "cast ballot" button.

19 Q. Thank you.

20 Could you explain to me what that means in
21 terms of it popping out and -- yeah, let's start with
22 that.

23 A. Well, usually, what we have found that it
24 means is that the voter did accidentally get close to
25 or touched the "cast ballot" button without realizing

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1 it because some of those machines are very sensitive.
2 Just like your cell phone, you can just hover your
3 figure over it and it'll do it. So that is what we
4 found out with most of those.

5 Q. Let's take it back a step.

6 So what kind of -- what is the nature of the
7 complaint like this with respect to why does it pop
8 back out? Is it because the voter --

9 A. Because the "cast ballot" button was touched
10 and that means it record the vote.

11 Q. Got it. Make sure I understand this
12 correctly.

13 A. Sure.

14 Q. The voter has hit some selections, the
15 screen pops up and then the vote goes through without
16 the voter having an opportunity to review it?

17 A. I'm not going to say that because I don't
18 know that's the case.

19 I know the voter has it in front of them.
20 If they lay their hand down or get anywhere near
21 that, it will cause it to cast the ballot. So that's
22 a voter issue not a machine issue.

23 Q. Fair enough.

24 How did you find out that hovering your
25 finger over the touch screen causes the ballot to be

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1 cast?

2 A. Because I've been doing these machines since
3 2002. It's through experience. It's not any
4 testing. It's not any super-secret squirrel mission
5 that we did. It's through use of the equipment.
6 That's one of the things that we noticed. It's not
7 very often, but it does happen on these machines.

8 Q. Has these issues occurred in elections prior
9 to 2018?

10 A. I'm sure it has. I just don't think it's
11 been significant because we don't get a lot of those
12 kinds of complaints. They are very, very few.

13 Q. Mm-hmm. Got it.

14 But you -- do you recall receiving
15 complaints about this issue in elections prior to
16 2018?

17 A. I'm sure I have because it's -- you know,
18 there's just a series of complaints that you get and
19 this is just one of the types of complaints that we
20 have gotten. But, again, very, very few and far
21 between for that particular type.

22 Q. Mm-hmm. And say that situation occurs for
23 whatever reason a voter -- say, I'm a voter and I
24 typed in one of my selections wrong and I cast the
25 ballot and I'm like, oh, I made a mistake, is there

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1 anything that can be done to allow that voter to --
2 allow me to recast the ballot or once it's in, it's
3 in?

4 A. Once it's cast, it's cast. There's no way
5 to retrieve a ballot.

6 Q. There's no way to retrieve a ballot on the
7 DRE machine?

8 A. Yeah because it's randomized. We wouldn't
9 have any idea which ballot was that voters.

10 Q. Got it. Perhaps we could flip to the second
11 page of Plaintiff's Exhibit 4.

12 A. Sure. When I touch a candidate on the right
13 side of the screen, it selects another candidate.
14 The right side of the screen is faulty on the third
15 to the last machine on the right side of the front
16 section of the voting booth. The machine made a
17 selection for me.

18 Q. What is the name of the voter?

19 A. Oh, Archel Bernard.

20 Q. Is essentially what Mr. Bernard saying is
21 that he tried to vote for candidate X and instead
22 candidate Y's name lights up as having been selected?

23 A. Mm-hmm. I think so, yes.

24 Q. How does that kind of problem occur?

25 A. I have no idea because I don't know --

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1 without being there, I don't know if the voter
2 touched something. If he had a big finger and put
3 his whole finger down and it registered one instead
4 of the other. I don't know if he had something on
5 him that touched the screen.

6 You know, without having been there, we
7 don't know. And that's, you know, another reason why
8 you have that review screen at the end, so if
9 something is incorrect, they can go back and correct
10 it before they cast their ballot. Like I said, it
11 would be pure speculation to guess that was what
12 caused that.

13 Q. Has this kind of issue cropped up in
14 elections before the November 2018 election?

15 A. Usually only in general elections when
16 there's parties involved --

17 Q. And --

18 A. -- which lead you to believe it's a voter
19 issue not a machine issue.

20 Q. Mm-hmm. Are you aware of any instances in
21 which you or a poll worker has seen this issue occur
22 where you tap one candidate's name and then a
23 different candidate's name lights up?

24 A. I have never seen it. I assume the poll
25 officials have since they are in the field with the

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1 voters. And if we get those phone calls, usually
2 that's what we determine is we will have them walk
3 the voter back through what they did. And oftentimes
4 it was -- like I said, something touched or whatever.
5 It didn't flip the vote.

6 Q. Just to make sure I understand, so poll
7 officials have called in to the Board of Elections
8 and said, Hey, I'm having an issue with a voter and a
9 machine where ballot flipping is occurring?

10 A. No. They don't use the word "ballot
11 flipping" because that's not what it is.

12 Q. Sorry, sorry. My words.

13 A. Something is different with the machine and
14 we can't tell if it's the voter or the machine. And
15 what we usually find out is it's the voter and not
16 the machine.

17 Q. Got it. Thank you.

18 A. Just make sure you get that correct.

19 Q. I appreciate that.

20 So have there been at least some instances
21 where the issue was not the voter?

22 A. Not to my knowledge.

23 Q. Could we please turn to the third page of
24 Plaintiff's Exhibit 4?

25 A. Cassandra Smith.

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1 Q. What is the nature of Cassandra Smith's
2 complaint?

3 A. Hers is similar to the first one, that she
4 was on her voting summary screen and the card popped
5 out before she intended for it to.

6 Q. So this is the same problem where the voter
7 is saying that --

8 A. It is.

9 Q. The voter is saying that the vote ended up
10 getting cast without her --

11 A. -- touching a ballot.

12 Q. -- initiating it?

13 A. Yes.

14 Q. Let's turn to the next page.

15 A. Patrice Tillman. This is where she said
16 she's touching the Democratic candidate, but the
17 Republican's name came up instead. And she was shown
18 how to unselect and reselect the vote.

19 And that was like very similar to what we
20 see all the time. And because the Democratic
21 candidate is below the Republican candidate, when you
22 go to touch it, if you're a female and you have a
23 long fingernail or you don't press it in the right
24 spot, it will pick up whichever one it reads the most
25 of. So it would have picked up the Republican

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1 candidate.

2 Q. Got it.

3 The fat finger issue?

4 A. Yes.

5 Q. Mm-hmm. Could we turn to the next page of
6 Plaintiff's Exhibit 4?

7 A. James Lamb. Similar issue to the first --
8 the first one where he was on his summary screen and
9 he says that it cast the vote. He saw the -- what's
10 he calling it -- the sand timer, the timer thing. I
11 can't think of what it's called.

12 MR. STEPHENS: The hourglass?

13 THE WITNESS: The hourglass. I'm sorry.

14 BY MR. POWERS:

15 Q. If you wouldn't mind taking me through --
16 was it Mr. Lamb's --

17 A. Yes.

18 Q. -- complaint and how an hourglass would show
19 up?

20 A. When you touch the screen, just like you do
21 on your computer, as it's going through thinking, it
22 has an hourglass and it just rotates. It doesn't do
23 anything. It's just there to show you that it's
24 thinking.

25 And so he saw the hourglass come up and

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1 thought that he still had time. But in actuality, he
2 probably had already touched "cast ballot" at that
3 point one way or the other, whether accidentally or
4 on purpose.

5 Q. Do these machines, DRE machines ever freeze?

6 A. Yes.

7 Q. Under what circumstances does a DRE machine
8 freeze?

9 A. I couldn't tell you. It's random. There's
10 no -- there's not anything special. It's just from
11 time to time, it's pieces of electronic equipment and
12 it will freeze up.

13 Q. Can a DRE machine freeze while a voter is in
14 the course of making selections?

15 A. Yes.

16 Q. What's the procedure that Gwinnett County
17 uses in the event a DRE machine freezes while a voter
18 is making selection?

19 A. They will turn the machine off and turn it
20 back on because that's how the card pops out. And
21 then they can look and see if there were any votes --
22 you know, if the voter cast their ballot, which
23 usually if it's frozen, it has not happened, in which
24 case they will be issued a second card.

25 They'll work with that machine. You know,

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1 they'll do a couple of things. And if it does not
2 come back up -- or correctly, then they close that
3 machine down and it's not used the rest of the day.

4 Q. Got it.

5 Could it happen that a machine freezes while
6 the voter is maybe almost finished casting the ballot
7 and then during the restarting process the vote is
8 actually cast and goes through?

9 A. Not to my knowledge.

10 Q. Could we please turn to the next page of
11 Exhibit 4?

12 A. Rebecca Duncan. Same thing, machine casted
13 my ballot while I was reviewing my ballot.

14 Q. Got it.

15 So this is the same as some of the
16 complaints we've seen before.

17 And what about the next complaint?

18 A. Melody Jordan. And she voted -- voted no --
19 let's see. Voted no -- she was having a problem with
20 one of the amendment questions. She said she was
21 voting on the issue. She was told to push summary
22 and it closed the voting machine down which meant
23 that it cast her ballot.

24 I have no idea if my ballot will be counted.
25 The machine was closed down so no one else would have

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1 to experience the total disappointment.

2 Q. So does that mean that the machine was taken
3 offline and no longer used afterwards?

4 A. Correct. And there may not have been
5 anything wrong with it. It's just what the poll
6 official decided to do based on this. I don't know,
7 so...

8 Q. Great. You can turn to the next page.

9 A. Sue Nash. Same thing, it's on the summary
10 screen and it cast her ballot.

11 Q. Can we turn to the next page?

12 A. Mm-hmm. I can't read this one. This one
13 sounds like a bad memory card. It said -- this is
14 from the poll official talking about a voter and said
15 When they put the card in, it came out and said it
16 was invalid. The count showed that the voter had not
17 cast their ballot, so they were reissued another
18 ballot and they voted on another machine.

19 Q. Can you help explain what happened with the
20 memory card? Was it a Ms. Lewis -- was it then --
21 what's the name of the poll worker?

22 A. Yes. Occasionally, you will have a memory
23 card -- a memory card? I apologize -- a voter access
24 card that has the little chip on it just like your
25 credit card does. And if that gets very, very

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1 dirty -- we try to get them to wipe them off multiple
2 times throughout the day, but there could be just
3 something has gone bad with that card.

4 And, oftentimes, if you put that in a
5 machine, it will come and tell you it's invalid. And
6 so when that happens, it won't cast a ballot. So the
7 voter has to be issued a second card. And sometimes
8 they'll vote on the same machine and sometimes they
9 want to go to a different machine. It's totally up
10 to a voter.

11 Q. How does the poll worker ascertain in a
12 situation like that, whether or not a vote was
13 actually cast?

14 A. They have to stop voting. And they go
15 around and take a count off of each of the machines.
16 And then they take a count of the number list of
17 voters off of the express poll and they match those
18 numbers up. If they are one less or one over, then
19 they determine the voter either did or did not cast
20 that ballot.

21 Q. That seems like a -- strike that.

22 So if we're at a polling place where there's
23 a lot of machines, am I getting it right, that you
24 have to take -- or stop voting at all of the other
25 machines and essentially count all of the ballots

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1 that have been cast at the precinct that day?

2 A. The number, yes. And they have to do that
3 on -- hourly anyway. And so it's not like they have
4 to start -- you know, if someone casts that -- if
5 that happens at five o'clock in the afternoon,
6 they're really just reconciling from their four
7 o'clock number on, not all throughout the day.

8 Q. Got it. Got it.

9 That process -- strike that.

10 How often does that happen on a given
11 election?

12 A. I couldn't tell you. Sometimes we know
13 about it and sometimes we don't. So we don't know.

14 Q. Mm-hmm. What is the Gwinnett County Board
15 of Elections' retention policy with respect to
16 complaint intake forms?

17 A. Two years, 24 months. And there's no --
18 that is just a county thing because we keep
19 everything 24 months by law, so we just include that
20 in that.

21 Q. So if there were complaint intake forms from
22 prior elections, say the November 2016 election, that
23 would have been disposed of 24 months after they had
24 been received?

25 A. Correct.

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1 Q. Have you received similar complaints about
2 DRE voting machines and elections prior to 2018?

3 A. Yes.

4 Q. What kind of investigation do you do to try
5 to figure out what the -- what the problems were and
6 what can be done about it?

7 A. Well, if the machine does not continue to
8 have problems, there's nothing to investigate. We
9 have no way of doing forensics on machines and that's
10 not our job.

11 If another voter -- and the poll officials
12 pay attention. If another voter has a problem with
13 the same machine, then they'll call us and say, Hey,
14 we've got this. And we would take that out of
15 service. We wouldn't allow it to be used the rest of
16 the day.

17 Q. You mentioned that the County doesn't have
18 an ability to conduct a forensic analysis of the
19 machines?

20 A. Correct.

21 Q. Have you had any situations where you
22 thought a forensic analysis of a particular machine
23 might be necessary?

24 A. No. If we take a machine out of service and
25 we get it back, it gets a ticket put on it and it

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1 goes straight back to the vender. And they look at
2 it. If there's anything wrong with it, they fix it,
3 correct it, retest it.

4 It comes back. It gets tested by Ken --
5 well, it used to be Kennesaw State, now the State.
6 It gets recertified and then gets sent back to the
7 County.

8 Q. Got it. And how frequently do you send
9 machines back to the vendor?

10 A. We send them every year, but the number is
11 relatively low. Maybe 10, if it's that many.

12 Q. Did you send roughly 10 machines back to the
13 vendor after the 2018 election?

14 A. I don't know.

15 Q. Could would you say 10 is a relatively
16 typical number --

17 A. Ten or less, yes.

18 Q. Who is the vendor that you're sending the
19 machines to for maintenance?

20 A. ES&S.

21 Q. When you send a machine to ES&S, do they
22 send you back the same machine or do they send you a
23 new one?

24 A. It depends. Ninety-nine point nine percent
25 of the time, it's the same machine because it's

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1 usually not a critical error. It's -- you know,
2 sometimes the batteries just need replacing.
3 Although it still may show 98 or 50 percent or
4 whatever, sometimes the battery on those will just
5 completely die. And we don't replace the batteries;
6 they do that.

7 We try to do that on a routine basis, but,
8 occasionally, you will have -- just like we said,
9 with the memory card battery, you'll have a battery
10 there that might have something wrong with it.

11 But usually we get back the same -- I only
12 know of maybe -- maybe two or three times that
13 they've actually replaced a machine. It's usually
14 just something very minor that they can correct with
15 the machine itself.

16 Q. In the two or three times that they have
17 replaced the machine, has the vender ES&S ever told
18 you why they replaced that?

19 A. Well, usually, that's not -- the screen died
20 or it gets -- has like wavy lines on it. So they
21 have to replace those -- those -- that's why I said.
22 It's not ever anything critical. It's always
23 something along that magnitude. There's not a
24 disconnect in the wiring or something like that.

25 Q. You mentioned the batteries sometimes die on

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1 the DRE voting machines?

2 A. Mm-hmm, even though they are charged every
3 three months. Yes.

4 Q. This is probably a dumb question, but who
5 does the charging of the DRE machines?

6 A. The prep center staff which is Kelvin,
7 Demond and Tiffany.

8 Q. Is it like there's a charging station --

9 A. No. We have what's called pigtail. So we
10 have -- if you were to see our warehouse, all of our
11 equipment is taking up about three-fourths of it.

12 And we have electric that comes down, pulls
13 down from the top and so they can plug in and charge
14 a whole group at one time. And every three months
15 that group one will get shifted. So they're
16 charging. They'll get shifted to the back. The next
17 group will move up and they'll get -- and so they
18 have a routine that they do the charging on those.

19 Q. Got it.

20 Do you have a team of county employees who
21 are moving the machines back and forth or is it the
22 charging outlets that are being moved?

23 A. It's the outlets at the top. They are being
24 pulled down and being put into the machines.

25 Q. Given the -- strike that.

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1 When you receive complaints like these from
2 voters, have you referred any to the Secretary of
3 State's Office for their investigation?

4 A. Because it doesn't usually have anything to
5 do with them, they don't have anything to do with the
6 equipment at that stage. That's a problem with the
7 piece. And so it guess to the vendor and not to the
8 State.

9 Q. Have you spoken with elections directors
10 from other counties or undertaken other steps to try
11 to minimize voter complaints about their experience
12 with casting ballots on DRE machines?

13 A. No. I don't think you can minimize it.
14 It's a voter issue. It's not a machine issue. So
15 it's a voter education thing.

16 So we try and -- there's -- I can't think
17 what they're called. There's little placards in the
18 booth. If people don't read them, then there's not
19 anything we can do about that.

20 When the machines were first rolled out, we
21 had a big voter education effort through the
22 Secretary of State's Office. And beyond that,
23 there's not anything that we've been able to
24 determine.

25 And like I said, when you look at the number

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1 of votes cast -- I mean, in this one election we had
2 338,125 and we've got, you know, five complaints.
3 That doesn't minimize these five complaints by any
4 means, but that lets me know that most everybody
5 understands how to use the equipment. It's just a
6 few.

7 And it may or may not have been their error,
8 but if the machine continues, we take it out of
9 service. We send it in. If it doesn't have any more
10 errors throughout the day, then you assume it's a
11 voter issue.

12 Q. Have you done any kind of voter outreach or
13 survey to see if voter issues with the machines are
14 more widespread than the complaints that have come in
15 through these intake forms?

16 A. No. We -- because, you know, if the voter
17 or the poll official will usually let us know if
18 there's issues. And we just got an outreach team two
19 years ago. And we just now started doing a lot of
20 going out into -- you know, taking the machines and
21 doing -- again, beginning to do demos and things like
22 that.

23 And, of course, that will ramp up with
24 whatever system the Secretary Raffensperger chooses
25 for us hopefully in the next couple of weeks.

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1 Q. Let's talk a little bit about the mechanics
2 by which the votes cast on DRE machines are counted.

3 Can you tell me about the process from the
4 point after which the memory cards are taken out of
5 the DRE machines at once polls have closed?

6 A. Mm-hmm. Once they've ran their tapes, they
7 remove the memory card. They are placed into a
8 sealed bag. They come into the Elections Office with
9 some other specific supplies that they have to turn
10 in on election night.

11 They go into another room where they were
12 unsealed. They're counted. And then they're put in
13 mail trays in what we call "election central." And
14 then they're taken by precinct. And information is
15 uploaded into the GEMS server where it is aggregated
16 to produce the election results.

17 Q. After that, are any kinds of reports
18 generated?

19 A. Yes. This five-page report -- five-column
20 report -- I'm sorry. Five-column report card, it's
21 printed out before we leave at night. We have to
22 provide that to the Secretary of State's Office.

23 Q. You're referring now to Plaintiff's
24 Exhibit 9?

25 A. Yes.

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1 Q. Where are these reports being generated
2 from?

3 A. From GEMS.

4 Q. Are the reports that are generated public
5 records?

6 A. They are.

7 Q. Are there any reports from the GEMS database
8 that you know of that are not public records?

9 A. I couldn't answer that.

10 Q. What other reports outside of the
11 statements -- statement of votes cast do you print
12 from the GEMS database?

13 A. I don't know.

14 Oh, write-in report. I apologize. . . We do
15 produce a write-in report.

16 Q. Thank you.

17 Earlier we talked about complaints that come
18 from voters with respect to situations where they say
19 the ballot was cast without them initiating it, as
20 well as situations where they say they voted for --
21 try to vote for one candidate but another candidate's
22 name lights up.

23 Are you aware of having received other
24 complaints from voters with respect to using DRE
25 machines?

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1 A. No. In a general rule, they like them.

2 Q. Are you aware of voters ever being issued
3 incorrect ballots when voting in person on a
4 DRE machine?

5 A. Yes.

6 Q. Could you please tell me about that?

7 A. Most oftentimes that happens during early
8 voting when they have every ballot style to choose
9 from. And -- but when the voter notices it, they
10 raise their hand and the poll official will eject
11 that card out of the DRE without -- you know, it does
12 not cast votes at that point and they are reissued
13 the correct ballot style.

14 Q. Are there -- strike that.

15 Could there be circumstances in which --
16 strike that.

17 Can anyone other than the voter ascertain
18 whether or not he or she has been issued an incorrect
19 ballot?

20 A. Just the poll official, but they are
21 issued -- you have Election Net that tells the poll
22 official what ballot style to code for that voter.
23 And then they have an express poll that has all of
24 that on it.

25 So, occasionally, they will -- you know,

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1 especially in a primary where you have two different
2 sets of Democrat and Republican. That's most of the
3 complaint. It's not necessarily the wrong ballot
4 style; it's the wrong choice. Either they wanted
5 Democrat and they got Republican or they wanted
6 Republican and they got Democrat.

7 And voters notice that pretty quickly when
8 they don't see Donald Duck's name; they see Mickey
9 Mouse pop up there. So when that happens, like I
10 say, we get that the card back and then we reissue
11 them the correct card.

12 Q. How does it happen that they're given the
13 wrong ballot?

14 A. Just like I said, they just touch the wrong
15 thing on the express poll.

16 Q. In terms of like which party, for example --

17 A. Correct. They'll be at the right precinct
18 and the right district combo, but they'll touch "R"
19 instead of "D," so it puts those Republican or
20 Democrat -- you know, whichever the case may be.

21 Q. And is that the poll worker who's hitting
22 the wrong --

23 A. Correct, yes.

24 Q. If a voter gets "D" instead of "R" and votes
25 in the wrong party's primary and says -- actually,

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1 strike that.

2 Let's take a hypothetical where a voter
3 votes in the wrong party's primary and actually casts
4 a ballot and comes back and says, I'm sorry, I voted
5 in the wrong party's primary, can I get a new ballot,
6 what happens next?

7 A. They can't -- once you touch "cast ballot,"
8 you have casted your ballot.

9 Q. We touched on this a little bit before, but
10 could you please describe the policies and procedures
11 currently in place to make sure that each voter's
12 ballot remains secret?

13 A. DRE? Absentee by mail? Provisional?

14 Q. Let's take DRE machines.

15 A. Okay. Well, obviously, nobody but the voter
16 sees their ballot. So once they are given their card
17 and they put it into the machine, it pulls up their
18 ballot -- which it only pulls up their ballot.

19 They go through and they make their
20 selections. They touch "cast ballot." When they do,
21 the machine -- the machine -- they yellow card pops
22 out. The card has nothing on it at that point; it's
23 reused throughout that day.

24 Absentee ballots, once they are received in
25 the office, once they are certified and good to be

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1 counted, they are actually in the prep center, which
2 is a secured location. And then within that secured
3 location they are kept in what's called ballot
4 vaults.

5 Each ballot vault has its own key lock code
6 and that code is changed between every election. And
7 then on election night when those ballots are opened,
8 the white envelope is sealed inside the yellow. The
9 yellow has the voter's name. One person splits that.
10 They take the Wite-Out ® ®. They separate it from
11 the yellow, but then the next person splits that and
12 takes it out. So the voter's name is two people away
13 from knowing who that voter was.

14 The provisional ballot, the voter loses
15 their anonymity because they're having to vote a
16 provisional ballot. So we know that -- you know,
17 because of research we have to do, we have to have
18 specific information.

19 And then the same thing, they are kept
20 secured from the time we start, you know, working on
21 those until we run them to be certified on
22 election -- I mean on certification day.

23 Q. Ms. Ledford, you had mentioned before that
24 when a voter casts a ballot on a DRE machine, that it
25 essentially could not be pulled back out under any

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1 circumstances; is that correct?

2 A. To my knowledge, it can't.

3 Q. Has the policy and procedure always been in
4 place?

5 A. For what?

6 Q. Fair enough.

7 Has it always been the policy or procedure
8 of the Gwinnett County Board of Elections that when a
9 voter casts a ballot on a DRE machine during early
10 voting, that that ballot cannot be pulled back out
11 under any circumstances, including in cases of double
12 voting?

13 A. To my knowledge, no, it cannot.

14 Q. Was that the case even prior to 2010?

15 A. Yes.

16 Q. Are you aware of situations in which ballots
17 have been pulled out in other counties in situations
18 where a voter had double voted?

19 A. No.

20 MR. POWERS: I think now would be a good
21 time to take a brief break.

22 (Recess from 2:03 p.m. to 2:19 p.m.)

23 BY MR. POWERS:

24 Q. I wanted to ask if you're aware of there
25 being calibration issues with respect to DRE voting

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1 machines? In particular, does it ever happen that a
2 DRE voting machine is not calibrated correctly?

3 A. No. It's not that it's not calibrated
4 correctly. It's calibrated correctly, but when it's
5 delivered and all the shifting in the move,
6 occasionally, we have had to recalibrate. But that's
7 something that's determined pretty quickly when the
8 poll opens.

9 The poll official opens it up and starts it.
10 If they see something or the first voter comes up and
11 says, Hey, this is not registering correctly, that's
12 one of the things that they look at is the
13 calibration.

14 Q. Can you explain to me what happens with
15 respect to -- I guess you said machines getting moved
16 around that causes this issue to pop up?

17 A. Yeah. When you do L&A testing, you take the
18 machine off of a shelf and you put it on a table.

19 You do the L&A. You close the machine up.
20 You seal it. It gets put onto a cart. Then the cart
21 gets rolled out to the loading dock. It gets taken
22 off the cart, put on the truck. It rides around in
23 the truck. It gets where it goes. It's taken off
24 the truck and moved into the polling location.

25 And so that's a lot of jostling and moving

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1 around. We have that, but we don't have it very
2 often. I mean, we've had it, so I know it exists.

3 Q. Did this issue pop up in the November 2018
4 election?

5 A. Not to my knowledge. I don't know.

6 Q. Did it pop up in the November 2016 election?

7 A. I would not know that unless it were a
8 widespread issue. If it were one or two like the
9 things we saw here, I would not know about it.

10 Q. So it's the moving of the machines on the
11 trucks and the transportation that causes --

12 A. That's what we've been told by ES&S.

13 Q. What ends up being displayed on the machine
14 that causes the poll worker or the voter to say, Oh,
15 there's something in this here?

16 A. Usually, it's just when they touch it and it
17 doesn't -- like, for instance, some of these where
18 they don't register correctly, that could have been
19 an issue, that it lost its calibration. That's
20 really how that's discovered because there's not
21 anything that you do necessarily at the poll. Like I
22 said, it's any type of testing phase that would make
23 that apparent.

24 Q. When you were pointing to here when giving
25 your answer prior, were you referring to the voter

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1 complaints --

2 A. Yes.

3 Q. -- that were in -- what was Plaintiff's
4 Exhibit --

5 A. Four.

6 Q. -- 4.

7 A. Yeah.

8 Q. This issue will actually occur on election
9 day; is that correct?

10 A. Yes.

11 Q. What's the County Board of Elections policy
12 with respect to fixing the problem?

13 A. The prep center staff will walk the poll
14 official through recalibrating.

15 Q. Remind me again who the prep center staff
16 would be.

17 A. Kelvin, Shantell -- I'm sorry. Kelvin,
18 Demond and Tiffany.

19 Q. Thank you.

20 The poll worker will then recalibrate the
21 machine themselves?

22 A. Mm-hmm, yes.

23 Q. If the poll worker isn't able to recalibrate
24 the machine, what happens next?

25 A. The machine closes down and it's tagged for

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1 repair.

2 Q. Has that ever happened?

3 A. I don't know for sure.

4 Q. Okay. Earlier you mentioned a retention
5 period of 24 months?

6 A. Mm-hmm, yes.

7 Q. Does the Gwinnett County Board of Elections
8 preserve DRE memory card data for 24 months?

9 A. I don't know.

10 Q. I think we've talked quite a bit about
11 proofing the ballot. I want to talk briefly about
12 proofing the GEMS database.

13 First, does the County Board of Elections
14 proof the GEMS database?

15 A. I don't know. That would be my deputy
16 director.

17 Q. Kristi Royston?

18 A. (Witness nods head affirmatively.)

19 Q. Is Ms. Royston the person on the Gwinnett
20 County Board of Elections staff most knowledgeable of
21 the GEMS database?

22 A. Actually, that would be Kelvin Williams.

23 Q. What are the responsibilities that Kelvin
24 Williams and Kristi Royston have respectively with
25 respect to the GEMS database?

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1 A. Well, Kristi is the deputy director, so she
2 just fills in where she's needed. She has done some
3 stuff in GEMS. Like I said, I'm not exactly sure how
4 she and Kelvin have divided up their duties with
5 that.

6 Kelvin is the elections coordinator. So
7 anything and everything that has to do with elections
8 falls under Kelvin. And Kelvin is the one who on
9 election nights sits in front of the machine. And,
10 you know, he has a group of folks and they get to
11 upload from the memory card from the polls into the
12 unit. He is one that does all the reporting at the
13 end and anything to do with the GEMS server really is
14 under Kelvin.

15 Q. What are Kristi Royston's primary
16 responsibilities?

17 A. In regard to GEMS?

18 Q. Generally speaking.

19 A. Like I said, she's the elections director.
20 So she assists me with making sure everything falls
21 into place and that we meet deadlines and statutory
22 requirements. She just helps me oversee the process,
23 all voter registration election processes.

24 MR. POWERS: Thank you.

25 I would like to turn to Plaintiff's

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1 Exhibit 7 and kind of go through -- sorry, a
2 couple of different pages here. If we could
3 turn first to the bulletin on July 26, 2018,
4 and if you could please take a second to
5 read it.

6 (Witness reviews document.)

7 BY MR. POWERS:

8 Q. Again, we're talking about Plaintiff's
9 Exhibit 7.

10 Could you briefly describe the July 26, 2018
11 bulletin?

12 A. The Secretary of State's Office was letting
13 the counties know that there was some suspected
14 Russian activity into the websites in Georgia, Iowa
15 and Florida.

16 Q. Did you receive this bulletin?

17 A. Yes.

18 Q. What action did you take in response to
19 receiving the July 26, 2018 bulletin?

20 A. We requested the onsite security assessment
21 from DHA.

22 Q. Did that onsite DHA assessment take place?

23 A. It did.

24 Q. Roughly when was that?

25 A. I don't remember. It was several months

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1 after this.

2 Q. What was the outcome of that?

3 A. We have not gotten our report -- oh --

4 MR. TYSON: That's okay.

5 BY MR. POWERS:

6 Q. Have you taken any other actions beyond
7 requesting the DHA assessment?

8 A. A security system was added to our front --
9 to our office. I won't say the front, the whole
10 office.

11 A camera system -- we're getting ready to do
12 a remodel and they are getting ready to include a
13 camera system as well as far as physical security.
14 And that was just in conversation with the DHA; that
15 was the first thing that he said.

16 Q. What is the purpose of the security camera
17 in the front office?

18 A. To be sure and watch all of the activities,
19 including anything that's going on in the prep
20 center; to make sure we don't have people coming in
21 from outside who aren't county employees or
22 authorized to be back there is some way, shape or
23 form.

24 And then what we call election central,
25 which is where the GEMS server is held currently, it

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1 is behind a double locked door. Only full-time
2 employees have access to that and we will continue
3 that. But the monitors will also be watching down
4 that hallway to watch that door to see who's coming
5 and going in and out of that room.

6 Q. Got it.

7 Did the Gwinnett County Board of Elections
8 take any other actions after receiving the July 26,
9 2018 bulletin?

10 A. No.

11 Q. Now, I'd like to ask you to turn to an
12 October 2nd, 2018 unclassified document from the
13 Department of Homeland Security.

14 A. Mm-hmm.

15 Q. And, in particular, if you wouldn't mind
16 reading the -- well, first let me go back.

17 What's the title of the unclassified
18 document from the Department of Homeland Security?

19 A. A Georgia Perspective on Threats to the 2018
20 U.S. Elections.

21 Q. What is the -- strike that.

22 Did you receive this unclassified document
23 from the Department of Homeland Security?

24 A. No. This came from the Secretary of State's
25 Office.

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1 Q. Fair enough. Let me ask a better question.

2 Did the Georgia Secretary of State send this
3 document to you?

4 A. I believe so.

5 (Witness perusing document.)

6 MR. POWERS: Take your time.

7 THE WITNESS: Yeah, I think it was
8 attached to an OEB. Yeah, it was -- yes, it
9 was an attachment to an OEB, to an official
10 election bulletin.

11 BY MR. POWERS:

12 Q. I should probably go back.

13 How do you receive official election
14 bulletins from the Georgia Secretary of State?

15 A. Through E-mail.

16 Q. Which official election bulletin from the
17 Georgia Secretary of State was this unclassified
18 Department of Homeland Security document attached to?

19 A. I don't know. I thought I printed them in
20 the order that they were on there. So this was --
21 that one's August.

22 I don't know. It would have been just an --
23 it would have been, like I said, something like this
24 kind of explaining to us what it was and then it
25 would have had attachments. And so I just printed

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1 the attachments.

2 Q. Got it.

3 If we could go back to the page that we
4 labeled, A Georgia Perspective.

5 A. Mm-hmm.

6 Q. What does the Department of Homeland
7 Security document say in general terms?

8 A. That they are worried about potential
9 influence into the voter registration and/or election
10 system for the state of Georgia.

11 Q. What's the date on the document?

12 A. October 2nd, 2018.

13 Q. Are there any specific threats listed in the
14 document?

15 A. Yes.

16 Q. Could you please read them off?

17 A. All of them?

18 Q. Yes, please.

19 A. All right. Unauthorized entry to the
20 polling places or long-term storage facilities and
21 voting facilities used to store election and voting
22 system infrastructure.

23 Incident of spear phishing or attempts to
24 hack voter registration systems, such as Department
25 of Motor Vehicles or other organizations used to

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1 register voters.

2 Attempts to access information technology,
3 IT infrastructure used to manage elections, display
4 results or for counting or certifying results.

5 Hacking or spear phishing attempts against
6 the E-mails or social media accounts of election
7 officials, staff or volunteers.

8 Hacking attempts of political party
9 headquarters or candidates' IT systems or websites.

10 Attempts to hack, alter or disrupt
11 infrastructure used to process absentee ballots or
12 attempts to interfere with votes sent through the
13 U.S. postal service.

14 Compromise of any networks or system by
15 cyber actors, including tactics, techniques and
16 procedures along with the impact observed on election
17 related systems.

18 Any unexplained disruptions at polling
19 places or training locations which block or limit
20 voter turnout. This may include social media
21 messages or robocalls falsely reporting changed or
22 closed polling locations or physical incidents at
23 polling location, including distribution of false
24 information.

25 Disinformation efforts to shut down

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1 government websites to foment social unrest and
2 reduce voter turnout.

3 Impacts to critical infrastructure that
4 limit access to polling stations such as power
5 outages, Internet, telephone, cellular and
6 transportation, traffic control outages.

7 Q. Thank you.

8 Are you aware of any of these potential
9 threats occurring in Gwinnett County?

10 A. No.

11 Q. Elsewhere in Georgia?

12 A. I couldn't speculate. I don't know.

13 (Plaintiff's Exhibit 11 was marked for
14 identification.)

15 BY MR. POWERS:

16 Q. I'm handing you what I've marked for
17 identification as Plaintiff's Exhibit 11.

18 Ms. Ledford, what is Plaintiff's Exhibit 11?

19 A. You tell me. Something from the -- Brian
20 Newby from the EAC about information provided to the
21 EAC by the FBI -- from the FBI, a document that
22 provides some information about IP addresses that
23 recommend election officials scan their systems to
24 ensure these IP addresses are not --

25 (Reporter requests that witness slow

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1 down.)

2 THE WITNESS: For election officials to
3 scan their systems to ensure these IP
4 addresses are not accessing election
5 systems.

6 BY MR. POWERS:

7 Q. Is there an attachment to -- strike that.

8 In Plaintiff's Exhibit 11, it starts with an
9 E-mail sent on August 23rd, 2016; correct?

10 A. Yes.

11 Q. There's an attachment to that E-mail called
12 BOE flash August 2016 final dot PDF.

13 MR. TYSON: Object just on foundation.

14 I don't think we've established she knows
15 what this E-mail is or that this was the
16 attachment. I understand it's all put
17 together as one, but maybe you want to
18 establish that she's seen or knows what this
19 is.

20 BY MR. POWERS:

21 Q. Let's turn to the third page. And this is
22 labeled FBI flash.

23 Have you seen this document before?

24 A. I don't remember.

25 Q. It is possible that you've received this

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1 document?

2 A. It could be.

3 Q. Have you received documents like these in
4 the past?

5 A. Not that say "FBI flash." Not to my
6 knowledge.

7 Q. What kinds of documents have you received?

8 A. The ones like we just saw in Exhibit 7.

9 Q. The document from the Department of Homeland
10 Security?

11 A. Correct.

12 Q. Are there instructions that you received
13 from the Secretary of State with respect to promoting
14 election security in and around the 2018 election?

15 A. I don't remember.

16 Q. Aside from the security assessment and
17 installing the camera in the Board of Elections, are
18 there any steps that the Gwinnett County Board of
19 Elections took to further promote the security of the
20 2018 elections?

21 A. Not to my knowledge.

22 Q. Are you aware of any attempted intrusions
23 into the Gwinnett County Board of Elections' website
24 or electoral infrastructure?

25 A. No.

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1 Q. I'd like to switch gears and talk to you a
2 little about Plaintiff's Exhibit 6.

3 In particular, who sent Plaintiff's Exhibit
4 6 to you?

5 A. I don't remember. It would have been either
6 for -- oh, Center for Elections Systems so Kennesaw
7 State University.

8 Q. Do you know when this was sent to you?

9 A. No. I don't remember.

10 Q. What did you do with Plaintiff's Exhibit 6
11 after you received it?

12 A. Gave it to Kelvin Williams or Kristi
13 Royston.

14 Q. Do you know what follow-up actions they
15 took?

16 A. Whatever it says to do in here.

17 Q. What is that?

18 A. It's how to export the election results from
19 the GEMS server to the state election night reporting
20 system.

21 Q. Thank you. If I could have it back for a
22 second.

23 If I could ask you to turn to the
24 introduction page on the PowerPoint slide in
25 Plaintiff's Exhibit 6. If you could just read off

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1 what that page says.

2 A. The SOS office has created a secure system
3 to facilitate the transition of files needed for the
4 election equipment. County election officials will
5 now receive their election files by remotely
6 accessing and SOS server and downloading their files
7 from this server to their local computer.

8 Your liaison will assist you in downloading
9 the required software and establishing the connection
10 to the SOS server. The following slides are an
11 overview of the file transfer process once the
12 initial setup has taken place. Please contact us if
13 you have any questions regarding the transferring of
14 files processed.

15 Q. Is this something that Kristi and Kelvin
16 would have worked with the Secretary of State's
17 Office?

18 A. Correct.

19 Q. Do you know who the liaison is with the
20 Georgia Secretary of State's Office?

21 A. It's changed several times over the last
22 couple of years. Since I don't know when we got
23 this, I don't know who it would have been at the time
24 and they may not even still be there.

25 Q. And I might have misspoken. Would it have

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1 been a liaison with the Center of Elections Systems
2 at that time?

3 A. No. It would have been with the Secretary
4 of State's Office.

5 Q. Okay. What files would that introduction in
6 the PowerPoint slide have been referring to?

7 A. The election results.

8 Q. Would it have been referring to the bulk
9 update?

10 A. No. This is the election results for
11 election night.

12 Q. Okay. Got it.

13 Where do the election results come from on
14 the county's side?

15 A. The GEMS server.

16 Q. Ms. Ledford, can you explain to me what an
17 undervote is?

18 A. Yes. It's when someone chooses not to vote
19 in a particular race. If you have "vote for two" and
20 you don't vote for anyone, that's considered an
21 undervote. I personally don't consider that an
22 undervote, but that's the legal definition of what an
23 undervote is.

24 Q. Thank you. Is it true that there is some
25 amount of undervote in down-ballot contests in

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1 statewide elections?

2 A. You see it more significantly in down-ballot
3 races, but it starts from the top.

4 I'm personally one of those people if I
5 don't like you, I'm not going to vote for you. I'm
6 not going to vote for the other person, but I'm not
7 going to vote for you either.

8 That's why I say the legal definition is
9 yes, but you actually see that. We see that even in
10 presidential elections years. People will skip the
11 presidential race and vote on everything else.

12 But as a general rule, most voters start out
13 voting everything at the top. By the time they get
14 to about middle ways to the ballot, you start getting
15 to the local candidates. You start getting to
16 constitutional amendments and statewide referendums.
17 You tend to see a lot of drop off.

18 Q. Is there a general pattern in terms of the
19 undervote rates?

20 A. Not that I've ever seen.

21 Q. Are you aware that there was an undervote in
22 the November 2018 lieutenant governor's race?

23 A. Yes.

24 Q. Are you aware that the undervote in the
25 November 2018 lieutenant governor's race was much

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1 larger than had been the case in similar past Georgia
2 elections?

3 MR. TYSON: Lacks foundation. Assumes
4 facts not in evidence.

5 You can answer if you know it.

6 THE WITNESS: What was the question
7 again?

8 BY MR. POWERS:

9 Q. Are you aware that the undervote in the
10 November 2018 lieutenant governor's election was much
11 larger than had been the case in similar past
12 elections?

13 MR. TYSON: Same objection, but you can
14 answer if you know.

15 THE WITNESS: I've never analyzed the
16 pattern, so I couldn't answer that.

17 BY MR. POWERS:

18 Q. Are you aware of any instances in the past
19 where the undervote for the lieutenant governor's
20 election was much higher than in other statewide
21 down-ballot elections?

22 MR. TYSON: I'll object. I think we're
23 assuming facts that she hasn't testified to
24 yet. So maybe if we can add some foundation
25 on that point, that might be helpful.

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1 MR. POWERS: Yeah.

2 BY MR. POWERS:

3 Q. We can pull out Plaintiff's Exhibit 10.

4 Take your time.

5 A. It's at the bottom of the stack evidently.

6 I don't have 10.

7 I have that in 9 -- oh, sorry, it was a

8 single --

9 BY MR. POWERS:

10 Q. Oh, sorry. I meant Plaintiff's Exhibit 9.

11 A. It's this one?

12 Q. Yes. Previously I asked you to describe the
13 number of votes cast and the lieutenant governor's
14 race by each candidate; correct?

15 A. Yes.

16 Q. As well as the governor's race; correct?

17 A. Yes.

18 Q. As well as other down-ballot races; correct?

19 A. Correct.

20 Q. Has anyone associated with the Gwinnett
21 County Board of Elections ever discussed the
22 undervote in the November 2018 lieutenant governor's
23 race with you?

24 A. Yes.

25 Q. Who is that?

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1 A. Steve Day.

2 Q. What did you-all discuss about the undervote
3 in the lieutenant governor's election 2018?

4 A. I don't remember the exact conversation. I
5 just know that, you know, after the election, he --
6 about two weeks later, he phoned me and said he had
7 noticed that and was asking me questions and I
8 couldn't answer his questions. And then I don't
9 think we talked about it anymore after that.

10 Q. What sorts of questions did he ask you?

11 A. I don't remember. I really don't. I've
12 slept since then.

13 Q. Did you or anyone associated with the
14 Gwinnett County Board of Elections conduct any kind
15 of analysis of the undervote in the lieutenant
16 governor's race?

17 A. Not to my knowledge.

18 Q. Have you ever considered doing any such
19 analysis yourself?

20 A. No.

21 Q. Do you know if anyone ever looked at the DRE
22 voting machines or any other aspect of the election
23 apparatus to look for any potential explanation for
24 the undervote in the 2018 lieutenant governor's race?

25 A. Not to my knowledge.

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1 Q. Are you aware of the elections.kennesaw.EDU
2 server being accessed by Logan Lamb and other
3 individuals.

4 MR. TYSON: I'll object. Facts
5 not in -- lack of foundation.

6 I'm sorry. You're asking if she knows
7 about it, so that's all right. I'll
8 withdraw the objection sorry.

9 THE WITNESS: Yes.

10 BY MR. POWERS:

11 Q. Did that cause you to change any of your
12 procedures in Gwinnett County with respect to
13 maintaining electoral data?

14 A. No.

15 Q. Didn't hearing about the Logan Lamb probing
16 cause you to change any other policies or procedures
17 you had been employing?

18 A. No.

19 Q. Are you aware of any security measures ever
20 having been taken in Gwinnett County to try to search
21 for malware or other signs of electronic intrusion
22 into Gwinnett County election data?

23 A. No, but I wouldn't be the one to answer that
24 question.

25 Q. Who would?

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1 A. IT.

2 Q. Who's the head IT person at the Gwinnett
3 County Elections Office?

4 MR. STEPHENS: If you know.

5 THE WITNESS: Yeah. Abe -- Abe Kani.

6 BY MR. POWERS:

7 Q. Have you done anything yourself to try to
8 find out whether there's been any kind of intrusion
9 into the Gwinnett County elections website or
10 electoral infrastructure.

11 A. No.

12 Q. Do you have any concerns about the
13 vulnerability of the existing DRE voting system to
14 intrusion?

15 A. No.

16 Q. Why not?

17 A. Well, like I told you before, I'm not a
18 techie. And for somebody to have -- to me, for
19 someone to have intrusion in that system, they would
20 have to actually go in, open up the machine and do
21 something to it because as we've said -- and I've
22 heard said many, many -- nothing that we have from
23 the GEMS database to that DRE unit is connected to
24 the Internet. From that unit going back to our
25 office, there's nothing connected to the Internet.

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1 So I don't know how somebody would get into
2 that system to create havoc or chaos or whatever you
3 want to call it.

4 And I also say that, you know, based on our
5 history with it, we've had many elections, we've had
6 many recounts, everything has always come out
7 correctly. And with the fewer voter complaints that
8 we got, I think if there was something going on, we
9 would hear more about it from the voters.

10 Q. Any other reasons?

11 A. No.

12 Q. Can election results on the existing DRE
13 voting system be audited?

14 A. Say that again. I apologize.

15 MR. POWERS: Court reporter, can you
16 please read the question?

17 (Whereupon, the record was read by the
18 reporter as requested.)

19 THE WITNESS: I do not know.

20 BY MR. POWERS:

21 Q. Are you aware of there ever being any audits
22 of DRE voting systems in Gwinnett County?

23 A. The only thing I know about that is that
24 Kennesaw State routinely comes out and does things
25 with the equipment. And by doing that, they're

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1 looking at the individual machines.

2 They will run some type of -- I think it's
3 called a hash program on the GEMS server to be sure
4 that there's nothing there.

5 So beyond that, I don't know -- nobody ever
6 touches our equipment outside of our staff and the
7 state.

8 Q. When was the last time that the hash
9 procedure was done in Gwinnett County?

10 A. I don't remember. It's been within the last
11 couple of years.

12 Q. Does the current DRE voting system in
13 Gwinnett County have an auditable paper trail?

14 A. You're talking about VVPAT, like voter
15 verified paper trail?

16 Q. I'm talking about -- fair enough. I'll ask
17 you a better question.

18 When a voter casts a ballot on a current DRE
19 voting machine, does the DRE machine create a paper
20 receipt?

21 A. Not for the individual voter, no.

22 Q. Have you received any instructions, advice
23 or guidance from the Secretary of State with respect
24 to improving the existing DRE voting system in the
25 past year?

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1 A. Improving the DRE voting system?

2 MR. POWERS: Would the court reporter
3 please repeat the question.

4 (Whereupon, the record was read by the
5 reporter as requested.)

6 MR. POWERS: Thank you. I'm sorry. I
7 missed a word. I'll ask the question again.

8 BY MR. POWERS:

9 Q. Have you received any instructions,
10 guidance, advise, anything like that, from the
11 Secretary of State with respect to security
12 improvements or enhancements with respect to the DRE
13 voting machines in the past year?

14 A. In conference, yes. It was discussed just
15 making sure that everyone was on the same page and
16 that everyone knew there was State Election Board
17 rules and regulation and code that talked about
18 security and who should have access and how you
19 should track your access and things like that.

20 So, yes, encouragement from the Secretary of
21 State to make sure those things are happening.

22 Q. Let's talk about that encouragement.

23 What -- you mentioned a conference?

24 A. Mm-hmm.

25 Q. What conference was this discussed at?

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1 A. It would have been either GEOA or VRAG, the
2 two conferences we talked about earlier. It would
3 have been during one of those.

4 Q. I know I mentioned them earlier or we
5 discussed them earlier, but can you unpack those
6 acronyms for --

7 A. Yeah. VRAG is the Voter Registrar's
8 Association of Georgia and GEOA is the Georgia
9 Election Officials Association.

10 Q. Thank you.

11 And, roughly, when did this conference take
12 place?

13 A. We have them twice a year, every other year.
14 Sometimes we have one a year and then the next year
15 we'll have two and the next year we won't have any.
16 So it depends on the presidential election cycle. We
17 try not to have them when we have other things going
18 on.

19 So I really couldn't -- I know it was
20 discussed. I don't remember which of the conferences
21 or when it took place.

22 Q. That's fair. You think that happened
23 sometime in 2018; is that correct?

24 A. Well, we didn't have a conference in 2018,
25 so it probably would have been in '17.

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1 Q. Aside from the 2017 conference, have there
2 been any other DRE voting machine security
3 enhancements or improvements?

4 A. Just what you saw -- what we have already
5 submitted.

6 Q. That was Plaintiff's Exhibit 6, the --

7 A. Yes.

8 Q. Okay. Are you aware of any plans to improve
9 the security of the DRE voting machine system in the
10 future?

11 A. I wouldn't know.

12 Q. Earlier when we talked about delivering the
13 voting machines to the polling place and I think you
14 had mentioned that there were 11 trucks that the
15 Gwinnett County Board of Elections has the DRE units
16 delivered on; is that correct?

17 A. Yes.

18 Q. Are those county trucks?

19 A. No. They're rental trucks.

20 Q. Is it county employees who are taking the
21 voting machines to the various polling places?

22 A. It is.

23 Q. What's the security protocol for the truck
24 delivery of the voting machines?

25 A. Meaning?

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1 Q. What steps are taken to ensure that the
2 voting machines aren't tampered with in some way
3 during the transportation process from the county
4 board to the polling place?

5 A. They are loaded up in the truck and locked.
6 And the truck's unlocked when they get to a location.
7 They unload them and they lock it back up and go to
8 the next stop.

9 Q. You said that it was like 18 -- I'm about to
10 totally make up a number.

11 It was a lot of DRE voting machines; right?
12 How many was it?

13 A. We have 1800, but we don't usually deploy
14 all 1800. It can be anywhere from 700 to 1200. It
15 just de -- or more. It just depends on, you know,
16 the election. For instance, the presidential
17 election is going to garner more voting equipment
18 than the special election we had in March.

19 Q. Mm-hmm. Right.

20 Does the county hire temporary workers to
21 transport all of these machines?

22 A. No. It's county employees.

23 Q. How long does it take to deliver all of
24 these machines to the various polling places?

25 A. Three to four days.

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1 MR. POWERS: I think now would be a good
2 time for a brief break.

3 (Recess from 3:07 p.m. to 3:26 p.m.)

4 BY MR. POWERS:

5 Q. Ms. Ledford, has the Secretary of State
6 decided which ballot marking devices are going to be
7 used in future elections in Georgia?

8 A. We have not been notified.

9 Q. Do you know when you will be notified?

10 A. No.

11 Q. Is Gwinnett County participating in a pilot
12 program for the new balloting devices for the
13 November 2019 election?

14 A. Not to my knowledge.

15 Q. Has Gwinnett County put in an order for new
16 ballot marking devices in 2019?

17 A. No because we don't know what we're getting
18 yet.

19 Q. Is it -- has Gwinnett County put in an order
20 for any new ballot marking devices?

21 A. No because we don't know what we're getting.

22 Q. When Gwinnett County eventually does --
23 strike that.

24 Is Gwinnett County conducting any county
25 election in November of 2019?

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1 A. No.

2 Q. First, let's talk about cost.

3 When Gwinnett County does eventually order
4 new ballot marking devices, is the county going to
5 have to pay some of the cost for the new devices?

6 A. Well, we have a potential distribution list
7 from the Secretary of State's office. So, you know,
8 those are just estimates. I think at this point I
9 don't think that's solid.

10 So once the system is chosen and we receive
11 the information about the numbers that we will be
12 getting, then we will sit down and analyze it,
13 determine if we feel like we need to order ballot
14 marking devices, poll -- you know, just whatever the
15 components are going to be.

16 So once we get that decision and we know
17 what those rollout numbers are, then that's something
18 that we'll sit down and look at.

19 Q. So at this point it's too early to say, for
20 example, whether or not Gwinnett County is going to
21 have to pay for any kind of warranty licensing or
22 maintenance fees?

23 A. Correct.

24 Q. Is it currently in Gwinnett County's plan to
25 use the new ballot marking devices for the March 2020

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1 presidential primary election?

2 A. If we have them by then.

3 MR. TYSON: Off.

4 MR. POWERS: Let's go off the record.

5 (Discussion ensued off the record.)

6 BY MR. POWERS:

7 Q. Presuming that the March 24th, presidential
8 primary election date holds, when will the Gwinnett
9 County Board of Elections need to receive the new
10 BMDs and all of the equipment to get them tested and
11 programmed and ready to use for the election?

12 A. I can't really say because I don't know --
13 you know, without knowing the type and how much we're
14 getting and what things are going to happen before we
15 ever get them from the Secretary of State's Office, I
16 really don't know.

17 But I can go back to what I was saying
18 earlier that we have to start voting 40 to 45 days
19 prior to the election. So we have to have something
20 in place by then.

21 Again, we're not privy to the rollout
22 information as to who is going to get in phases or
23 how that's going to work. We don't have that
24 information, so we just don't know.

25 Q. You'd have to also train election staff on

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1 how to use the new BMDs; correct?

2 A. Correct.

3 Q. Poll workers would need to be trained on how
4 to use the new BMDs; correct?

5 A. Correct.

6 Q. Would any kind of public education efforts
7 be made to educate voters on how to use the new
8 machines?

9 A. Yes.

10 Q. All of that would take some time; correct?

11 A. Yes.

12 Q. But it sounds like you don't know how much
13 time the board of election needs for training and
14 public education?

15 A. Huh-uh. We know it's going to be a long
16 time, but I couldn't say exactly how much.

17 Q. Are you spending any time now to plan for
18 implementation of the new BMDs?

19 A. We can't do that until we know when we're
20 going to get them and we don't know that information
21 yet.

22 Q. So, essentially, you can't do any planning
23 at this point?

24 A. Correct.

25 Q. I'd like to turn briefly back to the

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1 November 2018 election.

2 Did you or other Gwinnett County Board of
3 Elections staff receive complaints about long lines
4 at in-person voting sites?

5 A. Are you talking about election date or
6 advance voting?

7 Q. In November 2018. Let's start with election
8 day voting.

9 A. Yes because we had a problem at two of our
10 polling locations.

11 Q. What polling locations were those?

12 A. I don't remember. Annistown Elementary
13 which is precinct 2. I don't remember what the other
14 one was. It was in the Snellville area as well.

15 Q. Good memory.

16 What were the issues that happened in the
17 November 2018 -- at those two sites?

18 A. I think ultimately we determined that there
19 was some bad memory cards -- not memory cards --
20 voter access cards. We don't know how those got in
21 the stock or if it all happened -- we don't know how
22 that happened, but we did have two precincts that had
23 bad memory cards.

24 We didn't realize it was that. We thought
25 it was something with the express poll units, so we

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1 did testing, did just a few diagnostic things on that
2 and turned out not to be what it was.

3 And then we determined that it was the voter
4 access card. Once we got more voter access cards out
5 there to them, then they were able to start voting.
6 And it was still pretty much behind most of the day.

7 Voting never stopped. There were people
8 casting provisional ballots at those polling
9 locations or had the option. Some people chose not
10 to. Some people chose to come back. Some people
11 chose to go ahead and do it while they were there.

12 Q. At both of these polling sites -- strike
13 that.

14 So this voter access card problem was
15 essentially the same issue at both Annistown and the
16 Snellville polling place?

17 A. Yes.

18 Q. What does it mean if there's a bad memory
19 card?

20 A. It's not the memory card. It's voter access
21 card. It won't accept -- when you put it into the
22 express poll unit, it won't accept the ballot. It
23 won't accept the ballot program onto that. So when
24 you try to put it into a DRE, it just pops out and
25 tells you it's an invalid card. It won't allow -- it

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1 won't bring up a ballot to allow a voter to vote.

2 Q. Did that voter access card problem result in
3 all of the voting machines at both the Annistown and
4 Snellville polling places being inoperable for a
5 certain period of time?

6 A. Yes.

7 Q. Do you know roughly how long that was?

8 A. About an hour and-a-half to two hours, I
9 think at the longest.

10 Q. During that hour-and-a-half to two-hour
11 period, voters had the option of casting a
12 provisional ballot or waiting in line for the DRE
13 voting machines to be fixed?

14 A. Correct. Well, it wasn't the DRE machines.
15 It was the voter access card. The machines were
16 good. It was the voter access card that would not
17 program to let the machines do their job, yes.

18 Q. To further refine it, they weren't fixing
19 the voter access cards. They were bringing new voter
20 access cards to replace the faulty ones?

21 A. Correct.

22 Q. Great. Thank you.

23 During that period, did long lines develop
24 at both the Annistown and Snellville polling places?

25 A. They did.

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1 Q. Did you -- strike that.

2 What was the County Board's response, if
3 any, beyond sending the new voter access cards to the
4 existing polling places?

5 A. There wasn't. We just changed them out;
6 made sure they had good cards.

7 Q. Were voters -- strike that.

8 Did the County Board receive calls from
9 voters?

10 A. We did. Yes.

11 Q. What did the -- strike that.

12 Were the voters -- some of them upset?

13 A. Yes. Some them were upset. Some of them
14 were not, just wanted to understand why there was a
15 line. Once we explained it to them, some of them
16 were okay. Some of them were still angry. Some
17 people don't trust a paper ballot, so they didn't
18 want to vote on a provisional ballot. So they chose
19 to wait or to come back later in the day.

20 And that particular poll was also kept open
21 two hours by a judge for later in the day, so they
22 didn't actually close until nine o'clock.

23 Q. You're talking about the Annistown polling
24 place?

25 A. Yes.

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1 Q. Was the Snellville polling place kept open
2 late?

3 A. It was, but it wasn't as long. I believe it
4 was only about 45 minutes maybe.

5 Q. And you had mentioned that some voters said
6 that they were going to leave the polling place and
7 come back later?

8 A. Yes.

9 Q. Do you know if all of those voters ended
10 upcoming back to the polling place?

11 A. No. We do not because we didn't get their
12 names and we didn't track the information.

13 Q. Why were the voters who were waiting in the
14 lines at the Annistown and Snellville polling places
15 given the option of casting a provisional ballot?

16 A. Because that's what the State Election Board
17 rules say. If your equipment is inoperable, you have
18 that paper ballot as a backup.

19 And so we offered it. Some people took it.
20 Some people didn't. It just -- depending on what
21 their schedule was for the day.

22 (Plaintiff's Exhibit 12 was marked for
23 identification.)

24 MR. POWERS: I'm handing you what I've
25 marked for identification as Plaintiff's

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1 Exhibit 12.

2 (Witness reviewing document.)

3 MR. POWERS: Tell me when you've had a
4 chance do look at it.

5 (Witness continues to review document.)

6 BY MR. POWERS:

7 Q. Have you had a chance to take a look?

8 A. Yes.

9 Q. First, what is Plaintiff's Exhibit 12?

10 A. It is a declaration under penalty of perjury
11 pursuant to 28 U.S.C. Code 1746 for Derrick Oatis.

12 Q. And have you seen this document before?

13 A. No.

14 Q. On the third page, very top of the third
15 page, Mr. Oatis says that after being redirected, he
16 went to his polling place at the Suwanee public
17 library.

18 Are you aware of their being any issues in
19 the November 2018 election at the Suwanee public
20 library?

21 A. No.

22 Q. You don't recall receiving any complaints
23 from voters who were trying to cast ballots at the
24 Suwanee public library?

25 A. No.

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1 (Plaintiff's Exhibit 13 was marked for
2 identification.)

3 BY MR. POWERS:

4 Q. I'm handing you what I've marked for
5 identification as Plaintiff's Exhibit 13.

6 What is Plaintiff's Exhibit 13?

7 A. It is a declaration by Jeffrey Marion.
8 Declaration under personality of perjury pursuant to
9 28 U.S.C. Code Section 1746.

10 Q. Have you seen Plaintiff's Exhibit 13 before?

11 A. No.

12 Q. The voter's name here is Jeffrey Marion.
13 Do you see that?

14 A. Yes.

15 Q. It says his polling place is the Annistown
16 Elementary School?

17 A. Mm-hmm, yes.

18 Q. That's the -- one of the two polling places
19 that you were referring to in your prior testimony?

20 A. Correct.

21 (Plaintiff's Exhibit 14 was marked for
22 identification.)

23 BY MR. POWERS:

24 Q. I'm handing you what I'm marking for
25 identification as Plaintiff's Exhibit 14.

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1 What is Plaintiff's Exhibit 14?

2 A. It's a statement by Velma Lambert.

3 Declaration under penalty of perjury pursuant to 28
4 U.S.C. Code Section 1746 and/or a sworn statement in
5 accordance with Georgia law.

6 Q. Do you see that the declarant's name is
7 Velma Lambert?

8 A. Yes.

9 Q. She says she voted at the Evangel Community
10 Church in Snellville, Georgia?

11 A. Mm-hmm.

12 Q. Is the Evangel Community Church the other
13 polling place in Snellville that you were referring
14 to in your testimony a little while ago?

15 A. I don't remember. I remember it was the
16 Snellville area, but I don't remember which location
17 it was.

18 Q. Is it possible that the Evangel Community
19 Church is one of the two polling places that you're
20 recalling?

21 A. Like we have a lot of polling places in
22 Snellville, so I really don't know. My assumption
23 would be yes since it was another long line one.

24 Q. Do you recall receiving any complaints
25 specifically about the Evangel Community Church?

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1 A. I don't.

2 (Plaintiff's Exhibit 15 was marked for
3 identification.)

4 BY MR. POWERS:

5 Q. I'm handing you what I'm marking for
6 identification as Plaintiff's Exhibit 15.

7 What is Plaintiff's Exhibit 15?

8 A. The elections result report tape from
9 precinct 60 for the November 6, 2018 election.

10 Q. And I know we touched on this briefly
11 before, but could you remind me what the election
12 result tape is and how it's generated?

13 A. At the end of the day after the last voter
14 has voted, this is the report that prints out of each
15 DRE unit from each polling location.

16 Q. What is the purpose of the election result
17 report tape?

18 A. To report the results from that unit.

19 Q. Is there a time stamp associated with these
20 reports?

21 A. A time stamp?

22 Q. On the election -- sorry. I'll ask the
23 question again.

24 Is there a time stamp on the election result
25 report tape that's generated at the same time the

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1 report is being generated?

2 A. It looks like it.

3 Q. Is that time stamp made on every single
4 election result report tape that's generated by the
5 DRE machines?

6 A. Yes.

7 Q. Could you read for me the top of the
8 election result report tape?

9 A. Gwinnett County, State of Georgia general
10 election November 2nd, 2018.

11 Q. So this is for the November 6, 2018
12 election?

13 A. Yes.

14 Q. Below that it gives date, poll center,
15 machine ID and other information; correct?

16 A. Yes.

17 Q. And then below the report number it has a
18 time; correct?

19 A. Yes.

20 Q. The time -- what does the time here say?

21 A. 1:18.

22 Q. And then is there a date given to the right
23 of the time?

24 A. Yes.

25 Q. What is the date that's listed here?

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1 A. 06/02/2003.

2 Q. Shouldn't the date given on the election
3 result report tape be November 6th, 2018?

4 A. I don't know what that date's for, so that
5 could have been an update to the card. It could have
6 been an update to the machine and it's printing out
7 on this. I don't know what.

8 Q. If it was updating, why would it list a time
9 that happened 15 years ago?

10 A. Because that may have been when it was
11 updated. I don't know. Like I said, I don't look at
12 this part of the card. When I look at these, I'm
13 usually looking at the results. So I don't know what
14 the top part of that means. That's something you'd
15 have to ask somebody besides me.

16 (Plaintiff's Exhibit 16 was marked for
17 identification.)

18 BY MR. POWERS:

19 Q. I'm handing you what I'm marking for
20 identification as Plaintiff's Exhibit 16.

21 Actually, a little bit of clean-up. Before
22 we turn to 16, with respect to Plaintiff's Exhibit
23 15, would you mind telling me the precinct number and
24 name for Plaintiff's Exhibit 15?

25 A. It's precinct 60 Lawrenceville D.

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1 Q. Turn back to Plaintiff's Exhibit 16.

2 What is Plaintiff's Exhibit 16?

3 A. The election results report from Gwinnett
4 County, State of Georgia general election November 6,
5 2018.

6 Q. What is the precinct number and name on
7 Plaintiff's Exhibit 16?

8 A. Precinct 73, Pinckneyville P.

9 Q. And going down again to the time and date,
10 what is the time listed on Plaintiff's Exhibit 16?

11 A. 1824.

12 Q. So that would be 6:24 p.m.?

13 A. Sure.

14 Q. Is the date -- what's the date on
15 Plaintiff's Exhibit 16?

16 A. 11/06/2018.

17 Q. Do you know if that time and date stamp is
18 of the date and time that this election result report
19 is being generated?

20 A. I do not.

21 Q. Ms. Ledford, I'd like to go back to the GEMS
22 database which we discussed a little while ago.

23 A. Yes.

24 Q. How does the -- remind me again how the
25 Gwinnett County Board of Elections receives the GEMS

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1 database from the Secretary of State?

2 A. We go down to Atlanta and we sign for and
3 receive it in a locked container. And it's brought
4 back to the office.

5 Q. Who is the employee with the Gwinnett County
6 Board of Elections that goes down to pick up the hard
7 copy of the GEMS database?

8 A. It could be anyone from our -- any full-time
9 staff member.

10 Q. It just kind of depends on who's available?

11 A. Who has time, correct.

12 Q. Are there any limitations in terms of which
13 Gwinnett County Board of Elections employees have
14 access to or can be made available to pick up the
15 hard copy of the GEMS database?

16 A. No. Again, it's just whoever has time.

17 Q. Is any kind of nondisclosure agreement
18 required for Gwinnett County staff members who come
19 into contact with the GEMS database?

20 A. No.

21 Q. How many people have access to the GEMS
22 database?

23 A. The GEMS database?

24 Q. Mm-hmm.

25 A. Just two.

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1 Q. Who are those people?

2 A. Kristi and Kelvin.

3 Q. How many people have access to the GEMS
4 server?

5 A. Same.

6 Q. Does Gwinnett County have a GEMS license?

7 A. I don't know. I don't know.

8 Q. Who with the Gwinnett County Board of
9 Elections might know?

10 A. No one. It would be me, so...

11 Q. Is it fair to say then that Gwinnett County
12 Board of Elections does not have a GEMS license?

13 A. I would say so, yes, because it's not really
14 our program.

15 Q. When the Board of Elections employees
16 deliver the DREs to -- strike that.

17 When, for municipal elections, DRE voting
18 machines are transferred to the municipalities, is it
19 Gwinnett County staff or the municipality staff who's
20 responsible for transporting the voting machines to
21 the city?

22 A. The municipal staff.

23 Q. When they take possession of the machines,
24 do they have to sign any kind of documentation?

25 A. There is a chain of command paperwork. Yes.

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1 Q. Are there any restrictions or limitations or
2 requirements with respect to which employees with the
3 municipalities are permitted to pick up the DRE
4 voting machines?

5 A. Not from our side.

6 Q. When staff for the municipalities -- strike
7 that.

8 So if a municipality sent a contractor or
9 temporary employee to the Board of Elections to pick
10 up the voting machines, you wouldn't turn them away?

11 A. We've never had that, so it's always been
12 full-time employees of the City. I think that's just
13 a gentleman's agreement that we've had with them
14 since they started using the equipment.

15 Q. Got it. And do municipal employees have to
16 sign any kind of nondisclosure agreement when they
17 take possession of the DRE voting machines?

18 A. What would they have to disclose? So no. I
19 mean, there's nothing on the machine. They are
20 blank. They are shells when they get them. So, no,
21 there's no nondisclosure.

22 Q. When -- strike that.

23 Prior to DRE voting machines being
24 transferred to municipalities, is all of the memory
25 from those machines erased?

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1 A. I don't know. They don't have the memory
2 card in them, so that part is gone. As far as the
3 redundant, I'm not sure.

4 Q. The memory cards for the machines go
5 directly from the Georgia Secretary of State's office
6 to the municipalities?

7 A. No. The state doesn't have memory cards.
8 The memory cards are all with the voting unit. So if
9 they get a voting unit, they get the memory card with
10 it.

11 It gets programmed somewhere with the City
12 whether it be a contractor -- I don't know how that
13 part takes place. They just get the equipment and
14 the peripherals from us and that's it.

15 Q. Got it. So just to make sure I understand
16 this correctly, the municipalities are essentially
17 getting a blank -- that's probably a bad way of
18 putting it. Let me try again.

19 When the voting machines are transferred to
20 the municipalities, the -- is it accurate to say that
21 there's a blank memory card in the voting machines?

22 A. Correct.

23 Q. And the memory has been wiped from those
24 cards in advance?

25 A. Yes.

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1 MR. POWERS: Perhaps, we can take very
2 brief break.

3 (Recess from 4:06 p.m. to 4:15 p.m.)

4 BY MR. POWERS:

5 Q. Before we broke, you were talking about the
6 erasure of the internal memory of the DRE.

7 Can you explain to me in general terms how
8 the internal memory is erased from the DRE machines?

9 A. I cannot because I don't know when that's
10 done or how often that's done. I just know that in
11 periods that's done and that's really all I know
12 about it.

13 Q. Is there any particular requirement in terms
14 of when the data has to be removed or deleted?

15 A. Not to my knowledge.

16 Q. So is it a discretionary decision made by
17 the Board of Elections staff members?

18 A. No. It's not anything that we do. It's
19 done by the State.

20 Q. Can you explain to me how that process works
21 in terms of the State removing or deleting the
22 internal memory?

23 A. Well, if I'm -- I can't talk a whole lot
24 about it because I don't really know. I can tell you
25 that it has periodically happened since we've had the

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1 equipment since 2002.

2 I couldn't tell you if it's done because my
3 memory is just shot on this. I don't know if it's
4 every -- you know, after every presidential election.
5 I don't know if it's on any -- I don't know what the
6 cycle is on doing that. But I can tell you in the
7 life of the equipment that we have, it's been done
8 several, several times over the years.

9 Q. What's the chain of custody at that point?

10 A. It takes place at our office. They actually
11 send staff out to our prep center and that's what we
12 do.

13 We line the equipment up for them every day.
14 And I guess they have a list, an inventory list. And
15 they go through and make sure that they've hit all of
16 the equipment.

17 They do updates. They do all of that type
18 of internal, I guess, mechanizations or what they
19 deal with. The staff doesn't do anything with that.

20 Q. When these deletions happen, are they
21 removing the internal data on all 1800 voting
22 machines?

23 A. Correct.

24 Q. How many employees does it take to -- strike
25 that.

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1 How long does it take to delete the internal
2 memory from all 1800 voting machines?

3 A. They usually do it in about a week,
4 five days.

5 Q. Just to make sure I'm clear on something,
6 before the County Board of Elections transfers the
7 voting machines to the municipalities, is the
8 internal memory deleted as a matter of policy?

9 A. As a matter of policy, no. Like I said it's
10 not something that's done by our staff. It's done by
11 the State. And I couldn't say if it's done before --
12 like I said, I don't know what routine it is. So I
13 don't know that it was always done, you know, in an
14 even numbered year which is when we have elections
15 versus odd numbered years which is when most of the
16 cities have their elections.

17 Q. As the -- strike that.

18 When was the last time that the internal
19 memory was removed or deleted from the DRE machine?

20 A. I don't know. I could tell you it was
21 before 2018 and I don't know if it's been done since
22 then.

23 Q. Thank you.

24 Now, let's consider a situation in which
25 municipalities had to vote using optical scan.

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1 How many optical scanners would
2 municipalities need to conduct an election entirely
3 using optical scan?

4 A. It depends on the size of the
5 municipalities. We have some that only have, I
6 believe, 1600 registered voters and we've got one
7 that's got almost 30,000. So it just depends on the
8 size of the city and what they anticipate their
9 turnout is going to be.

10 Q. Based on historical patterns in the past
11 ordering practices of the municipalities, what's the
12 range from the municipality with 1600 people to the
13 one with 30,000 people?

14 A. For optical scan units?

15 Q. (Counsel nods head affirmatively.)

16 A. They usually take two to four because the
17 ones that take two have one and they use it for
18 backup. And the ones that take multiple would be
19 bigger cities where they were doing their early
20 voting. You know, they would have them if somebody
21 needed to cast a provisional ballot or further
22 absentee ballot process. So two to four.

23 Q. Got it. So a city with 30,000 people might
24 need four optical scan units?

25 A. Mm-hmm.

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1 Q. How many optical scan units does the
2 Gwinnett County Board of Elections currently own?

3 A. I think we have 36 -- 32 or 36.

4 Q. Thirty-two or 36?

5 A. Yes.

6 Q. So in a situation where cities were
7 conducting elections using optical scan units, would
8 you anticipate receiving a request from --
9 for optical scan units from all Gwinnett County
10 municipalities or only those that currently request
11 DRE voting machines from you?

12 A. Well, we have 16 cities wholly or partially
13 located in Gwinnett and there is no rhyme or reason
14 as to when or how they choose to use the equipment.

15 So I'm not qualified to answer that question
16 based on I just don't have the history -- it's just
17 all over the place and I wouldn't want to speculate
18 on that.

19 Q. Got it.

20 So there are 16 municipalities in Gwinnett
21 County?

22 A. Yes.

23 Q. Are they all conducting their own elections
24 in November of 2019?

25 A. For the ones that are having them except for

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1 Braselton and Jackson County because it's the City of
2 Braselton and, actually, Walton County conducts the
3 City of Auburn.

4 Q. What about Buford?

5 A. They conduct their own.

6 Q. Let's consider now the March primary
7 election.

8 If Gwinnett County were holding an election
9 using optical scanners for the March 2020 primary,
10 how many optical scanners would the County need?

11 A. I don't know. We would need -- it would
12 have to be a minimum of two for 156 polling
13 locations. That would be a bare minimum.

14 You've got people standing in line. It
15 takes a while to read those. In Gwinnett County, our
16 ballots usually are a little bit longer, so we have
17 to account for that as well.

18 We also have eight advance voting locations.
19 We would need a minimum of five at those so whatever
20 that number would be. And, like I said, that would
21 be just the bare minimums. That would not suffice.
22 You would have to have three or four units at the
23 site and probably 10 at the advance voting sites
24 because those scanners are not very quick either.

25 Q. You've reminded me of something.

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1 So I'm going pivot quickly back to DRE
2 voting machines and in particular to the DRE voting
3 machines that are used for early voting.

4 A. Mm-hmm.

5 Q. Roughly, how many DRE voting machines are
6 used for early voting in, you know, the November
7 election in an even numbered year?

8 A. We have 15 at seven at the sites and 35 at
9 our office.

10 Q. Make sure I understand this correctly.

11 There are seven early voting sites and each
12 of them, every single one will have 15 --

13 A. -- 15.

14 Q. -- DRE machines? Got it.

15 So all total, there's well over a hundred
16 DRE voting machines used for early voting?

17 A. Correct.

18 Q. Are those voting machines that are used for
19 early voting also used for voting on election day?

20 A. No. You can't do that.

21 Q. Why is that?

22 A. Because that's the way the rules are set up
23 on that. Those machines, when they close down on
24 Friday, they are sealed up, sequestered and they are
25 brought back to our office. And that's where they

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1 stay sealed until 7:00 p.m. on election night.

2 Q. You may have said this and I just missed it.

3 When are the DRE early voting machines
4 physically moved from the early voting location to
5 the Board of Elections Office?

6 A. On election they're -- some of them are
7 actually on Friday night as soon as the polls closed
8 and then others are on Saturday and Monday. We try
9 to have them out -- our satellites are community
10 centers at our parks and we don't want to leave the
11 equipment there, you know, more than what we have to
12 even though it's sealed and corded and all that.

13 Q. Yeah. Now I'm going to pivot back to
14 optical scan world.

15 Does the Gwinnett County board ever have to
16 purchase its own optical scanners?

17 A. Yes.

18 Q. Why does it have to do that?

19 A. Because the initial rollout in 2002, I
20 believe, we had maybe 20. And we knew that we were
21 going need more than that, so we purchased just five,
22 six, seven, whatever, here, there over the years.
23 And that's to accommodate not only the absentee
24 ballot but also the provisional ballot because that
25 has continued to get larger and larger. And with

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1 that, we need the machines to count those ballots as
2 well.

3 Q. Where -- strike that.

4 Where do you go to buy new optical scanners?

5 A. ES&S.

6 Q. And you purchase it directly from ES&S?

7 A. Correct.

8 Q. Have you ever looked to see if Gwinnett
9 County could purchase additional optical scanners
10 from other elections who used to use that kind of
11 optical scanner but no longer do?

12 A. You mean outside the state of Georgia?

13 Q. Anywhere. Anywhere.

14 A. We can't use any equipment from outside the
15 state of Georgia. We can't buy -- I apologize. Let
16 me take that back.

17 I think we can actually buy used equipment
18 now, but that just changed within the last few years.
19 But we haven't needed to purchase any that way, so
20 ours have come through ES&S.

21 Q. I was going to ask if you're aware if some
22 counties in Georgia actually had received optical
23 scanners from counties from other states?

24 A. I know that other states made it available.
25 I don't know personally of any county. We've just

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1 never had that discussion.

2 (Plaintiff's Exhibit 17 was marked for
3 identification.)

4 BY MR. POWERS:

5 Q. I'm handing you what I've marked for
6 identification as Plaintiff's Exhibit 17.

7 Could you please tell me what Plaintiff's
8 Exhibit 17 is?

9 A. It's the Election Day Management Training
10 Workbook for the 2018 General Election.

11 Q. Thank you.

12 A. Mm-hmm.

13 Q. If you wouldn't mind turning to chapter
14 five. I think it's actually the last page of the
15 exhibit.

16 A. Mm-hmm.

17 MS. MARKS: She's on a different page
18 than you are.

19 MR. POWERS: I'm looking at a page that
20 has 60 at the top left-hand corner?

21 THE WITNESS: I don't have that.

22 (Discussion ensued off the record.)

23 BY MR. POWERS:

24 Q. So what is corrected Plaintiff's Exhibit 17?

25 A. It's the Election Day Manager Manual.

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1 Q. If you wouldn't mind turning to page 60.

2 A. It's actually chapter five of that.

3 Q. Chapter five?

4 A. Yeah.

5 MR. TYSON: Just so we're clear for the
6 record, this is a portion of the manual not
7 the complete manual; is that correct?

8 THE WITNESS: Yes.

9 MR. TYSON: Just so that's clear for the
10 record.

11 MR. POWERS: Thank you.

12 BY MR. POWERS:

13 Q. What does chapter five page 60 of the
14 Election Day Manager Manuel discuss?

15 A. The log sheet for actions taken on DRE and
16 express poll.

17 Q. Would you mind reading the first sentence?

18 A. Whenever an update or canceling action is
19 taken either on the express poll or the DRE.

20 Q. It provides a series of steps after that; is
21 that correct?

22 A. Mm-hmm.

23 Q. Is one of those below that, does it say that
24 one of the actions that must be recorded include
25 canceling a ballot on the DRE unit?

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1 A. Yes.

2 Q. What are the steps that poll officials have
3 to go through if they are canceling a ballot on the
4 DRE unit?

5 A. I'd have to look. I don't remember. It's
6 been a long time since I've done it myself.

7 Q. Specifically, I'll point you to the second
8 sentence of the first paragraph on the --

9 A. Updating a voter's status?

10 Q. Yeah.

11 A. If a voter is issued an absentee ballot, the
12 express poll does not reflect whether that ballot was
13 received back or not.

14 . . . So if the voter shows up at the poll and it
15 shows in the express poll that they have been issued
16 an absentee ballot, in order for that voter to then
17 be allowed to vote at the poll, they either have to
18 have the ballot with them to cancel it or they fill
19 out a cancelation form.

20 Once they do that, the poll workers go into
21 Election Net -- I'm sorry -- express poll and they
22 unmark that voter. And they will take out that
23 absentee notation and put the voter back in an active
24 eligible status. And then they encode a voter access
25 card and the voter goes to the DRE unit to vote.

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1 Q. So that's a situation where -- is that --
2 okay.

3 So is that what is being described here with
4 respect to canceling a ballot on the DRE unit itself?

5 A. No. That's canceling it on the DRE -- I'm
6 sorry. That's canceling it on the express poll so
7 that they can then cast it on the DRE.

8 Canceling a ballot on the DRE is the
9 situations we discussed earlier. If the voter gets
10 the wrong ballot and they realize it but they've put
11 the card in, it comes up and it's Republican versus
12 Democrat. Then the only way to get the card out
13 without casting a ballot is to cancel the ballot even
14 though it hasn't been cast yet.

15 So we also have to do that from time to
16 time. And if they do that, then they have to mark
17 that, too, because that's part of their
18 reconciliation at the end of the day.

19 Q. So that cancellation has to be recorded here
20 even if that vote had been started never actually
21 gets completed?

22 A. Correct.

23 Q. It's not referring to a situation which a
24 voter actually completed casting a ballot?

25 A. Right. Because as we said earlier, once you

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1 cast the ballot, it starts randomizing it in the
2 unit, so we would have no way to identify that
3 voter's ballot.

4 MR. POWERS: Got it. Thank you.

5 (Plaintiff's Exhibit 18 was marked for
6 identification.)

7 BY MR. POWERS:

8 Q. I'm handing you what I'm marking for
9 identification as Plaintiff's Exhibit 18.

10 What is Plaintiff's Exhibit 18?

11 A. Official election bulletin from the
12 Secretary of State's Office regarding open records
13 request.

14 Q. Did you receive this official election
15 bulletin from Chris Harvey?

16 A. Yes.

17 Q. What does Plaintiff's Exhibit 18 say?

18 A. Multiple counties have reported receiving
19 open records requests asking for data such as DRE
20 audit logs, copies of DRE tapes and ballot image
21 reports and/or copies of ballot images.

22 Q. Could you please read for me the sentence in
23 the third paragraph of Plaintiff's Exhibit 18?

24 A. Ballot images are not subject to open
25 records requests per the advice of the Attorney

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1 General's Office.

2 (Plaintiff's Exhibit 19 was marked for
3 identification.)

4 BY MR. POWERS:

5 Q. I'm handing you what I've marked for
6 identification Plaintiff's Exhibit 19.

7 A. Mm-hmm.

8 Q. What is Plaintiff's Exhibit 19?

9 A. I have no idea. I've never seen it.

10 Q. Is Plaintiff's Exhibit 19 a ballot image
11 report?

12 A. I don't know. I've never seen this before.
13 I've never seen one of these.

14 Q. Have you ever seen a ballot image report
15 before?

16 A. No. No.

17 Q. That's fair. Do you know why ballot image
18 reports are no longer a public record?

19 A. I don't know they were ever public record
20 because we've never been asked for one. If that's
21 what this is, I've never seen one, so I don't know.

22 So, no, I do not know.

23 MR. POWERS: Fair enough. I need
24 another minute or two. Take a break. But I
25 think it might be easier actually for you

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1 guys to stay and us to move because I am
2 coming to the end.

3 (Recess from 4:43 p.m. to 4:45 p.m.)

4 MR. POWERS: Plaintiffs have no further
5 questions. We would like to meet and confer
6 regarding the discovery issues outlined in
7 your respective letters once the deposition
8 is concluded.

9 MR. TYSON: I just have a couple of
10 questions for you, Ms. Ledford.

11 EXAMINATION

12 BY MR. TYSON:

13 Q. Mr. Powers asked you earlier about whether
14 you trusted the DRE system. Do you remember that
15 question?

16 A. Yes.

17 Q. Why is it that you trust the DRE system that
18 we use in Georgia?

19 A. Basically, again, it's a history thing. The
20 way that everything is brought in and programmed and
21 sealed and secured and checks and balances -- and the
22 one thing I will say to that is all these experts
23 that have tested all this equipment have never done
24 it in a true election environment. They set up their
25 own environment. They really have no idea what we do

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1 and nobody's ever really asked.

2 So I think that there's oftentimes a rush to
3 judgment without asking proper questions or getting
4 more detailed information. And, you know, for those
5 of us in elections administration, we take our jobs
6 very, very seriously. And we want every election to
7 be as good as it can.

8 There's no perfect election. There's
9 absolutely no perfect election equipment, but we've
10 not had -- to my knowledge, we've not had problems
11 with ours or it's not questionable.

12 Q. We definitely appreciate your work and all
13 the work of your staff.

14 A. Thank you.

15 MR. POWERS: And I do, too.

16 BY MR. STEPHENS:

17 Q. Mr. Powers asked you as well about feeding
18 ballots through optical scanners for recounts?

19 A. Mm-hmm.

20 Q. When you have a ballot that is long or
21 additional size, does that take longer to feed
22 through the optical scanner?

23 A. The optical scanners that we have are not
24 high speed scanners as most people who have watched
25 us count those things knows and if you have -- you

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1 know, and different ones react different ways to
2 different ballots.

3 So sometimes you have what's called
4 shuffling. You put it in. It will shuffle it three
5 or four times and then it takes it. The next one it
6 will take and the next one it will shuffle it. Well,
7 it won't take, so then you have to turn it upside
8 down. You have to do it backwards. You have to do
9 it different orientations.

10 So, you know, like I said, you can try to
11 average an amount of time to do a ballot, but if
12 you've got a two-page 18-inch ballot, which is what
13 we had in November and especially when you have
14 multiple folds within the ballot as well, it creates
15 additional time to read those ballots.

16 The easiest ballots to read are the
17 provisionals because they're straight. We print
18 them, we duplicate them and they go straight into the
19 optical scan. But the provisional -- absentee
20 ballots are very, very difficult to scan.

21 Q. Then there was some discussion earlier about
22 the process. You mentioned having to duplicate
23 98 percent of the provisional ballots.

24 Can you explain a little bit what ballot
25 duplication means for paper ballots?

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1 A. Yes. One of the reasons that people can
2 choose to vote a provisional ballot is if they show
3 up at an incorrect poll and they don't have time or
4 make a fuss and don't want to go to the correct poll.
5 Poll officials are -- at that point will offer them a
6 provisional ballot.

7 Well, if they're at the wrong polling
8 location, the ballot at that poll are only for -- or
9 the precinct are only for that precinct. So if you
10 have a voter that lives in Dacula but they are trying
11 to vote in Snellville, that ballot is not going to be
12 the same.

13 So when that ballot comes in on election
14 night, we have to research that and we pull the
15 correct ballot for the voter. And then we take the
16 ballot that they actually voted and anything that
17 they were eligible to vote for, we transfer onto that
18 duplicate ballot. And they're labeled "original" and
19 "duplicate." And then the duplicate is what is
20 actually read for tabulation.

21 And the duplication process involves three
22 people. You have to have one person read the
23 original ballot, one person mark the duplicate ballot
24 and one person to monitor that process.

25 Q. Would you consider the ballot duplication

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1 process a time consuming exercise?

2 A. Yes. Because it's very manual. It's a
3 very, very laborious process. When people are tired,
4 you know, we came in at four, five o'clock on
5 election morning and we only have three days to get
6 these things done and you're trying to do everything
7 else. You've got to wrap up an election.

8 It's an accurate process but, again, it
9 takes a very long time to get there.

10 Q. Once you start counting ballots after the
11 polls close on election night, is there a requirement
12 that you continue counting until you finish?

13 A. Yes. We would love that law to be changed.
14 They missed that House Bill 316. I'm just saying.

15 And I understand. You don't want to lose
16 the integrity of the system. And there are people
17 who would think that some Keebler elves come in and
18 manipulate ballots or do something.

19 So, yes, we stay there until we're done,
20 which is oftentimes -- depending on the election
21 could be two or three o'clock in the morning or it
22 could be like this last election where it was four
23 o'clock in the afternoon the next day.

24 Q. So Wednesday afternoon at four o'clock is
25 when you finished the 2018?

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1 A. Yes. And we came in at five o'clock on
2 Tuesday morning.

3 Q. And that was an election that involved both
4 DREs for the majority of votes and then paper ballots
5 for a small subset?

6 A. Correct. And there was a problem with the
7 printing of the ballots. DeKalb County had a
8 problem. Gwinnett had a problem.

9 (Reporter requests that witness slow
10 down.)

11 THE WITNESS: Gwinnett and DeKalb had
12 that problem. So duplication was greatly
13 multiplied during that time. So almost
14 every ballot had to be duplicated. And then
15 some of the duplicated ballots had to be
16 duplicated as well.

17 And so it was a -- and it's a very
18 manual, very laborious process -- laborious,
19 I'm not sure how you pronounce that word.

20 BY MR. TYSON:

21 Q. And so when you're describing that ballot
22 printing issues, did that keep the paper ballots from
23 being read by the optical scanners?

24 A. Correct.

25 Q. And that's why you had to have duplication

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1 where it was a format they could actually read?

2 A. Yes.

3 MR. TYSON: I don't have any further
4 questions.

5 MR. STEPHENS: Cheryl?

6 EXAMINATION

7 BY MS. RINGER

8 Q. You had spoken a bit about the number of
9 optical scanners that you had. If you had to do a
10 countywide optical scan paper ballot election, how
11 many scanners do you think you would need?

12 A. I know we talked about that earlier. You
13 would have to have a very, very minimum of two per
14 156 --

15 Q. That's what I missed. I was looking at my
16 notes and I didn't get it, so --

17 A. Yeah. We said a very, very minimum of two
18 for 156 polling locations and then very, very minimum
19 of five for seven satellite voting locations and the
20 main office.

21 Q. I missed that. Okay.

22 A. I don't know where we would store all those
23 ballots either.

24 MS. RINGER: No further questions.

25 MR. POWERS: No redirect.

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1 THE REPORTER: She's reading and
2 signing, I take it? Is she reading and
3 signing?

4 MR. STEPHENS: Yes.

5 THE WITNESS: Yes.

6 (Transcript orders taken by audio
7 record.)

8 (Deposition concluded at 4:52 p.m.)

9 (Signature reserved.)

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CERTIFICATE

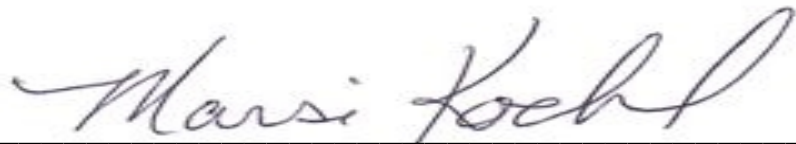
STATE OF GEORGIA:

COUNTY OF FULTON:

I hereby certify that the foregoing transcript was taken down, as stated in the caption, and the colloquies, questions, and answers were reduced to typewriting under my direction; that the transcript is a true and correct record of the evidence given upon said proceeding.

I further certify that I am not a relative or employee or attorney of any party, nor am I financially interested in the outcome of this action.

This the 28th day of June, 2019.



Marsi Koehl, CCR-B-2424



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DISCLOSURE

STATE OF GEORGIA:

COUNTY OF DEKALB:

Deposition of TERESA LYNN LEDFORD.

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Marsi Koehl, CCR-B-2424

Date: 6/28/19

Curling et al. v. Deposition of
Raffensperger et al. T. LYNN LEDFORD

6/24/2019

UNITED STATES DISTRICT COURT
FOR THE NORTHERN DISTRICT OF GEORGIA
ATLANTA DIVISION

DONNA CURLING, et al.,)
)
Plaintiffs,)
) CIVIL FILE ACTION
vs.)
) NO. 1:17-cv-02989-AT
)
BRAD RAFFENSPERGER, et al.,)
)
Defendants.)

The preceding deposition taken in the matter, on
the date, and at the time and place set out on the
title page hereof.

It was requested that the deposition be taken by
the reporter and that same be reduced to typewritten
form.

It was agreed by and between counsel and the
parties that the Deponent will read and sign the
transcript of said deposition.

Curling et al. v. Deposition of
Raffensperger et al. T. LYNN LEDFORD

6/24/2019

1 CERTIFICATE

2 STATE OF
3 COUNTY/CITY OF4 Before me, this day, personally appeared, TERESA
5 LYNN LEDFORD, who, being duly sworn, states that the
6 foregoing transcript of her deposition, taken in the
7 matter, on the date, and at the time and place set out
8 on the title page hereof, constitutes a true and
9 accurate transcript of said deposition.10 _____
11 TERESA LYNN LEDFORD12
13 SUBSCRIBED and SWORN to before me this
14 _____ day of _____, 2019 in the
15 jurisdiction aforesaid.16
17 _____
18 My Commission Expires Notary Public19
20
21 ☐ No changes made to the Errata Sheet; therefore, I
22 am returning only this signed notarized certificate.23
24 ☐ I am returning this signed, notarized certificate
25 and Errata Sheet with changes noted.

Curling et al. v. Deposition of
Raffensperger et al. T. LYNN LEDFORD

6/24/2019

1 DEPOSITION ERRATA SHEET

2 Deponent: TERESA LYNN LEDFORD

3 Deposition Date: June 24, 2019

4 To Reporter:

5 I have read the entire transcript of my deposition
6 taken in the captioned matter or the same has been
7 read to me. I request that the following changes be
8 entered upon the record for the reasons indicated. I
9 have signed my name to the Errata Sheet and
10 appropriate Certificate and authorize you to attach
11 both to the original transcript.

12
13 Page No. Line No.

14 Change to:

15 Reason for Change:

16

17 Page No. Line No.

18 Change to:

19 Reason for Change:

20

21 Page No. Line No.

22 Change to:

23 Reason for Change:

24

25

Curling et al. v. Deposition of
Raffensperger et al. T. LYNN LEDFORD

6/24/2019

1 Deposition of TERESA LYNN LEDFORD
2
3 Page No. Line No.
4 Change to:
5 Reason for Change:
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7 Page No. Line No.
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9 Reason for Change:
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13 Reason for Change:
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15 Page No. Line No.
16 Change to:
17 Reason for Change:
18
19 Page No. Line No.
20 Change to:
21 Reason for Change:
22
23
24 Signature: Date:
25 TERESA LYNN LEDFORD

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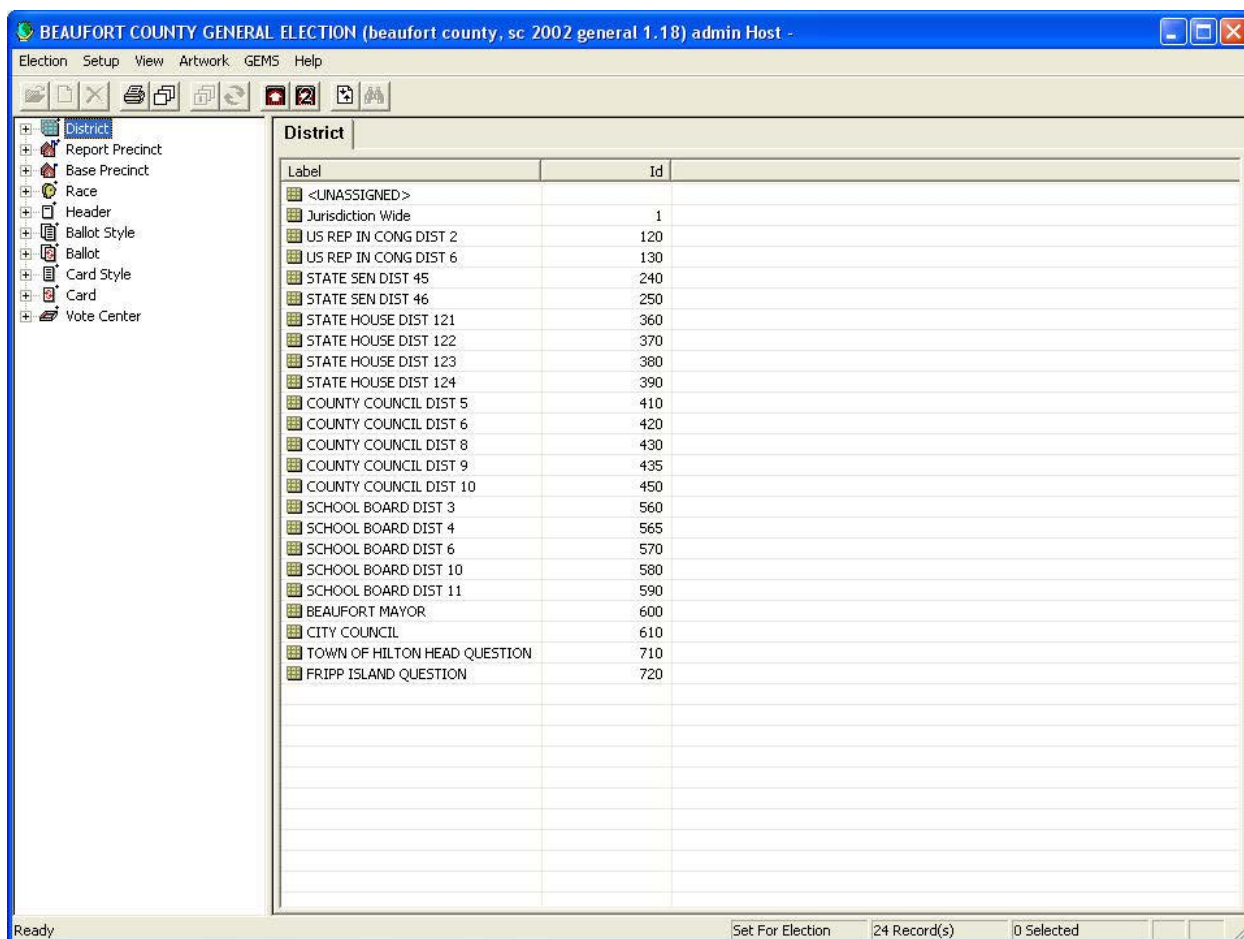


Figure 2-6. GEMS window

2.3. Deleting a database

A GEMS database may be deleted as follows:

1. Activate GEMS either from the Start menu or from the desktop.
2. In the Connect to Database window, select the desired database in the Existing Database Name list, then click on the Delete button.

3.2.1. Configuring the election

In order to configure election options when configuring the election:

1. Click on Setup in the menu bar, then Election in the drop-down menu.

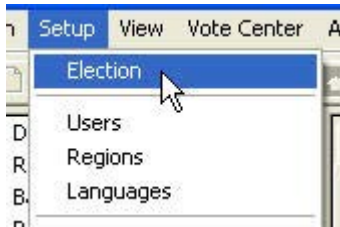


Figure 3-8. Selecting Election Options

2. Define an election title no more than three lines in the Name of Election field. This title appears on all GEMS administrative and election results reports.
3. Specify the election date and time in the Election Date/Time fields. The entire election date may be selected from a drop-down calendar, while the day and year may be also be entered manually. Changing the date or year automatically cause the weekday to be set accordingly.

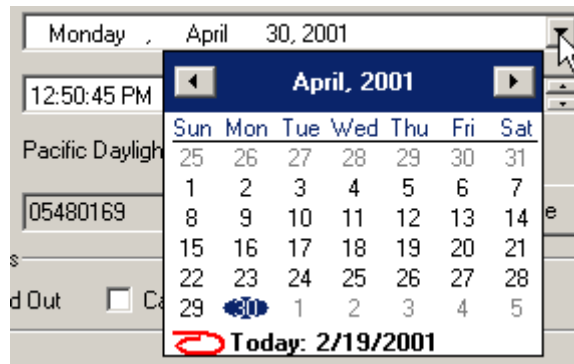


Figure 3-9. Activating the calendar

The calendar is activated by clicking on the drop-down list arrow. An earlier or later month may be selected by clicking on either of the arrows in the top left- and right-hand corners of the calendar. A month may also be selected by clicking on the month name in the calendar, which activates a drop-down list containing all months of the year, from which the desired month may be selected.

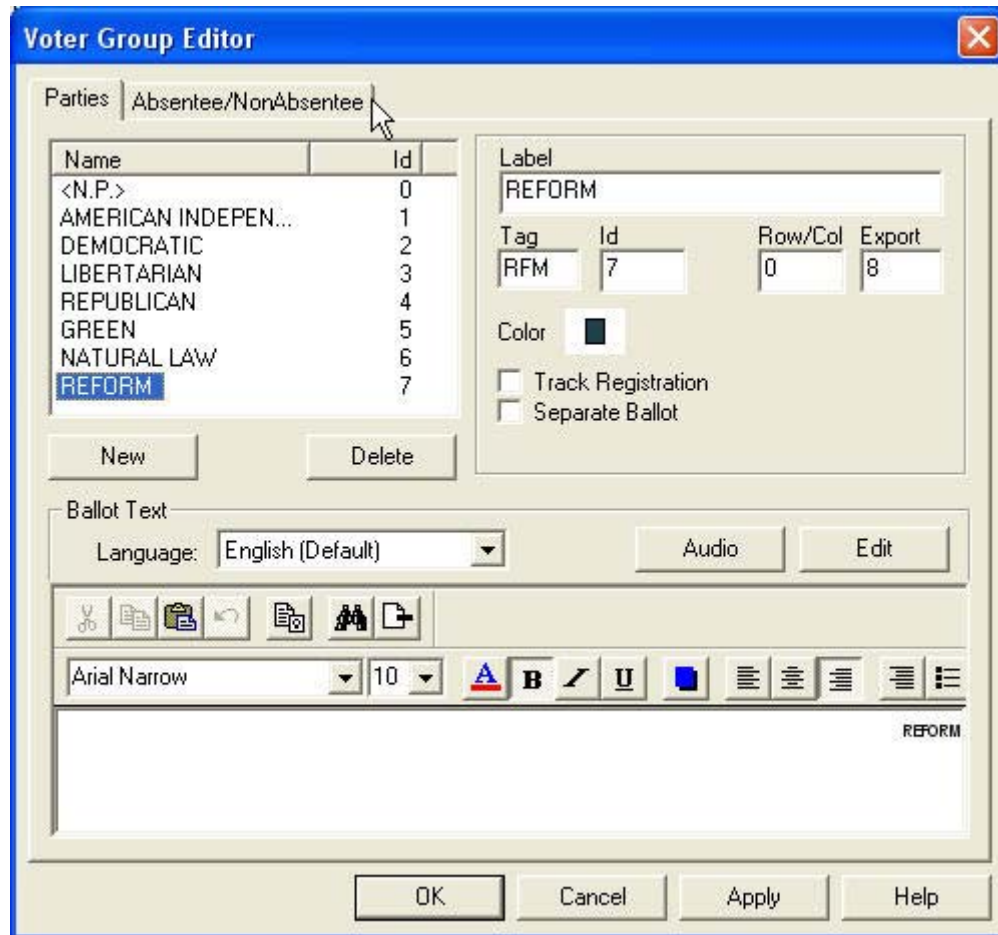


Figure 3-26. Defining voter groups under the Parties tab

13. If polling and absentee voters are to vote on distinct ballots, click on the Absentee/NonAbsentee tab in order to define Polling and Absentee voter groups.
14. Click on the New button.
15. The new voter group appears with 'VGroup 20' by default in the Label entry field, as well as in the Name display column. Select the label value, and enter 'Polling'.
16. Enter a 1 to 3 character party code corresponding to the Polling voter group in the Tag field.
17. Change the Id number if the sequence in which the voter group appears is to be altered.
18. Enter an export Id in the Export field, if required.
19. De-select the Rotate Ballots check box if polling ballots are not to be rotated.
20. Enter a value into the Percent Ballots field between 0 and 100, if card quantities are to be computed by absentee/non-absentee voter group.
21. Click on New again, and now define the Absentee voter group in a similar manner.

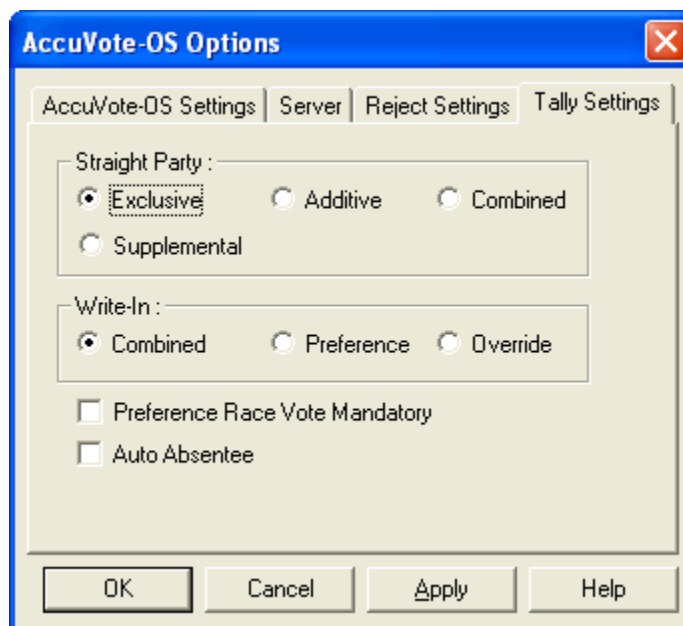


Figure 3-46. AccuVote-OS Options - Tally Settings tab

22. Click on the OK button in order to save results.

3.11. AccuVote-TS Options

AccuVote-TS display and counting options are defined in the AccuVote-TS Options window. These options do not apply to the AccuVote-OS. Changing AccuVote-TS Options requires that memory cards be re-programmed.

Refer to section 3.8 *AccuVote-TS Options* in the *GEMS 1.18 Reference Guide* for an explanation of the concepts behind AccuVote-TS options in GEMS.

1. Click on Setup in the menu bar, then AccuVote-TS Options in the drop-down menu.



Figure 3-47. Activating the AccuVote-TS Options window

2. Enter the height of the voting mark box in pixels in Vote Box Size, if it differs from the default value.



3. Change the number of columns the ballot is to be laid out over in the Columns field, if it differs from the default value.
4. Enter a desired ballot scale percentage in the Scale Factor field.
5. Enter the desired button height in pixels in the Button Height field.
6. Select the One Click Vote check box if voters are not to re-select an existing candidate selection before making another selection. In order to require the voter to re-select a candidate in order to make another selection in a race, do not select this check box.
7. Select the PA Straight Party check box if existing candidate selections are to be retained upon making a straight party selection. In order for candidate selections made prior to the straight party choice to be lost, do not select this check box.
8. Select Hide Instruction Page to hide the Jump Button 'Instruction' and the Instruction Page. Deselect Hide Instruction Page to show the Jump Button 'Instruction' and the Instruction Page.

The Instruction Page describes how to use the AccuVote-TS unit for voting. The Jump Button 'Instruction' displays the Instruction Page when pressed. The Instruction Page is displayed after the voter inserts their voter card into the AccuVote-TS unit. The Jump Button 'Instruction' is displayed on every page of the voter's ballot.

9. Select Hide Summary Page to hide the Jump Button 'Summary' and the Summary Page. Deselect Hide Summary Page to show the Jump Button 'Summary' and the Summary Page.

The Summary Page displays a summary of all races and voter's selections for each race after the last race on the ballot has been displayed. The Jump Button 'Summary' displays the Summary Page when pressed. The Summary Page is displayed when the last race on the voter's ballot has been displayed and the Next button is pressed. The Jump Button 'Summary' is displayed after the Summary Page has been displayed and either a race summary is selected or the Back button is pressed.

10. Select Hide Jump Buttons to hide the Jump Buttons 'Instructions' and 'Summary'. Deselect Hide Jump Buttons to show the Jump Buttons 'Instructions' and 'Summary' during a voter's voting session.

(See the descriptions of the Instruction and Summary Pages options above.)

11. Select the Confirm Ballot check box if a confirmation dialog box prompting the user to confirm that they would like to cast their ballot is to be displayed before the voter's ballot is cast.
12. Select the Voter Group Color check box if the color defined for a voter group in the Voter Group Editor is to determine the AccuVote-TS background page color in a closed primary election. Do not select the check box if the voter group color is not to determine the AccuVote-TS page color in a primary election. Do not select the check box in a general election.
13. Select the Race Keys check box in order to be able to advance to the next race, or return to the previous race, without traversing the entire candidate list. In order to require the voter to traverse the entire candidate list in order to advance to the next race, or return to the previous race, do not select this check box.
14. Leave the Play All Candidates check box selected in order to require the audio voter to traverse the entire candidate list before continuing to the next race, or returning to the prior race. Deselect the check box in order to allow the voter to traverse voted candidates only in the candidate list if the maximum number of candidates have been voted in the race.
15. De-select the Warn Undervotes check box if the audio voter should be able to continue to the next race or return to the prior race without being presented with an undervote warning, if less than the number to vote for has been voted in the race. Leave the check box selected if the voter is to be presented with a warning message upon attempting to leave an undervoted or blank voted race.



16. Select the Pollworker Audio check box if an audible tone is to be played at the outset of voting the ballot as well as upon ballot casting. Do not select the check box if no audible tone is to be played in the course of voting.

The AccuVote-TS supports installation of a printer called the AccuView Printer Module (AVPM). This printer has been designed to allow voters to print and review their selections in each race while voting their ballot on the AccuVote-TS unit. When using the AVPM, voters may also optionally change and reprint their selections before their ballot is cast. A summary of all races on the voter's ballot (including races in which no votes are cast) and all voter's selections are printed to the AVPM summary/verification tape.

For information on installing the AVPM on an AccuVote-TS unit, see the *AccuView Printer Module Hardware Guide*.

17. Select Disable AVPM to disable printing ballot summary/verification information. When this option is not selected, ballot summary/verification information will be printed to the AVPM installed on the AccuVote-TS unit.
18. Select Print Candidate IDs to print the candidates ID numbers and names on the AVPM summary/verification tape. When this option is not selected, candidate names are printed, but their ID numbers are not.
19. Select Print Bar Codes to print all ballot summary/verification information in human readable text format and bar code format. When this option is not selected, candidate names are printed in human readable text format only.
20. Select Bar Code with Write-Ins to print barcodes of candidate names and Write-In candidate names in human readable text format and bar code format on the AVPM summary/verification tape. Note that when using this option, the Print Bar Codes option must also be selected. When this option is not selected, all candidate names are printed in human readable text format only.
21. Select Use Dual Roll to configure the AVPM to print summary/verification information on one paper roll and election reports on another roll.

Note: Printing reports on one paper roll and ballot summary/verification information on another requires manually uninstalling and reinstalling the appropriate paper roll on the AccuView Printer Module during an election. See the *AccuView Printer Module Hardware Guide* for details.

22. Select Log to Printer to print Audit Log entries to the AccuVote-TS printer. Deselect this option to disable printing Audit Log entries to the AccuVote-TS printer.
23. Select Pedantic to print all trivial Audit Log entries to the AccuVote-TS printer. Deselect this option to disable printing trivial Audit Log entries to the AccuVote-TS printer.

For example, an audit record is created for every ballot that is cast on the AccuVote-TS unit.

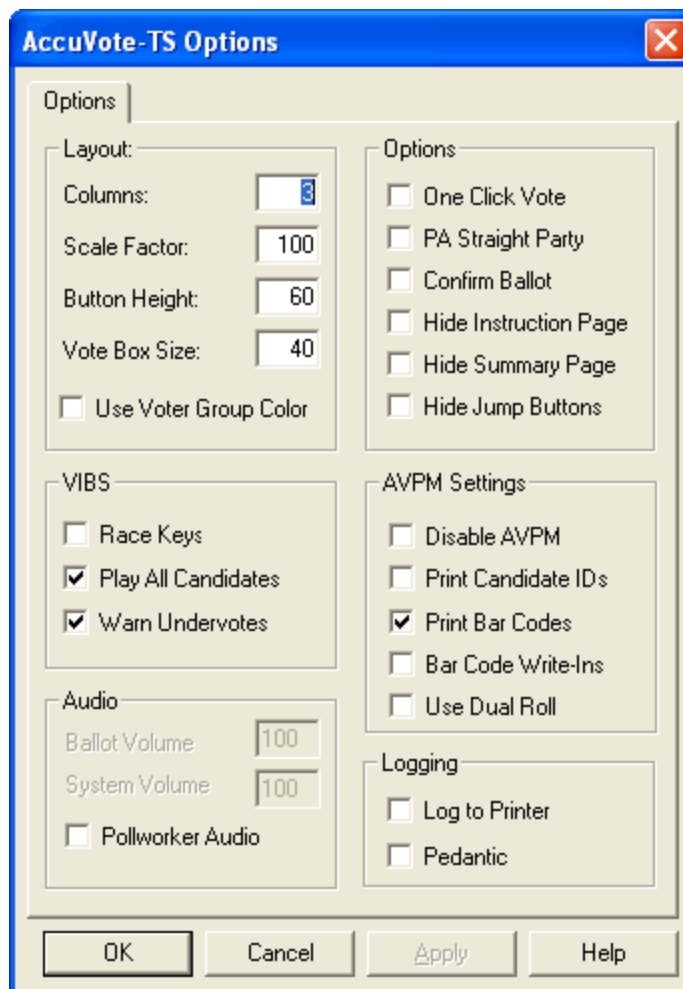


Figure 3-48. AccuVote-TS Options window

24. Click on OK in order to save results.

3.12. Reporting sets

Races are grouped into *reporting sets* for the purpose of customizing election results reports, composing monitor scripts, and configuring recounts. Instead of directly selecting the races intended to be included in an election results report, the desired set of races may be pre-defined as a report set.

Refer to section 3.9 *Reporting Sets* in the *GEMS 1.18 Reference Guide* for an explanation of the concepts behind reporting sets in GEMS.

3.12.1. Adding reporting sets

1. Click on Setup in the menu bar, then Reporting Sets in the drop-down menu.

9. Once the last district category has been defined, click on the OK button in order to exit the District Editor and save results.



Figure 4-2. Adding a district

10. Now districts are added to each district category. Select the first district category in the expanded district list in the tree view, right-click, and select Add Sub-District in the pop-up menu.

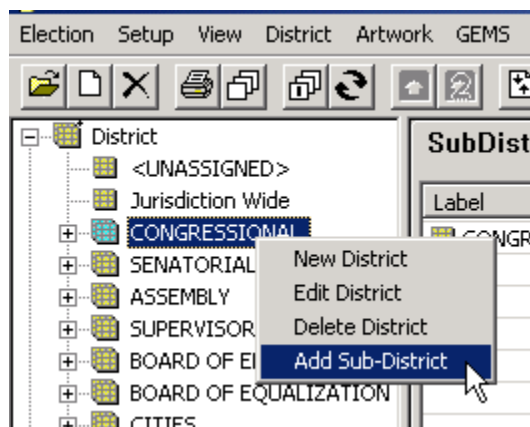


Figure 4-3. Adding a sub-district

11. Enter the full district name in the Label field in the District Editor.
12. Change the Id number in the Id field in order to change the sequence of the district within the district category, if necessary.
13. Enter a tag value in the Tag field.
14. Enter an export value in the Export field, if necessary.
15. Specify the rotation number in the Start Rotation # field, if the district category is a rotation district.
16. Click on the Add button.
17. Continue adding districts in the district category in this manner.
18. Once the last district has been defined to the district category, click on the OK button in order to exit the District Editor and save results.
19. Continue adding districts to the remaining district categories in the same manner.



The District Editor dialog box has a title bar with a close button. It contains the following fields and buttons:

- Label:** A text field containing "CONGRESSIONAL THIRD".
- Id:** Two numeric fields separated by a hyphen, both containing "10".
- Tag:** An empty text field.
- Export:** An empty text field.
- Buttons:** OK, Cancel, Add, and Help.

Figure 4-4. Rotation district

4.1.3. Updating districts

Update districts as follows:

1. Double-click on the district to update.

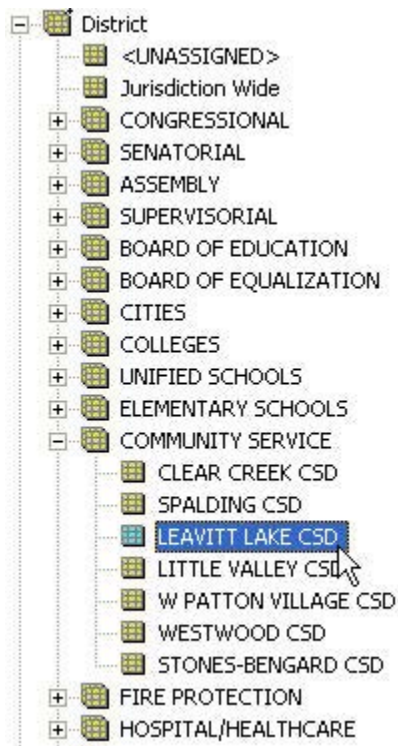


Figure 4-5. Opening District Editor for update

2. In the District Editor, change the descriptive district label in the Label field, if necessary.
3. Change the Id number in the Id field in order to change the sequence of the district in the district list, if necessary.
4. Change the tag value in the Tag field, if necessary.

5. Enter or change the export value in the Export field, if necessary.
6. Click on the OK button to save changes.
7. Continue updating districts as necessary.

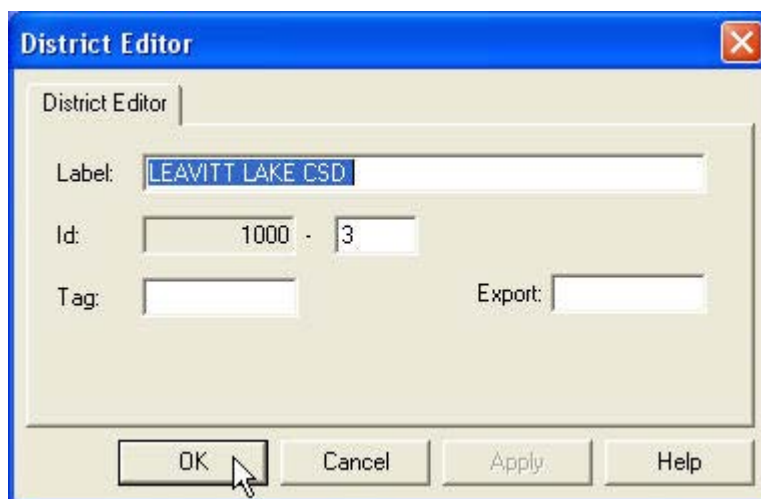


Figure 4-6. Adding a district

4.1.4. Deleting districts

Deleting a district removes the district from the database as well as any of the district's linkages to base precincts. Any race linkages defined for the district are set to <Unassigned>. Deleting a district category removes the category as well as all subdistricts from the database. A district category that has been set to rotation district cannot be deleted until the Rotation District check box is de-selected.

1. Expand the district category in the tree view.
2. Select the district and click on the Delete Record icon.
3. Click on the Yes button in order to confirm the deletion.
4. Continue deleting districts in this manner.

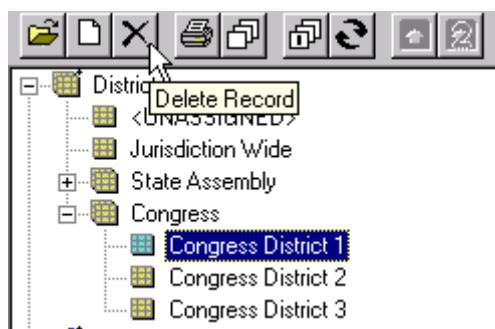
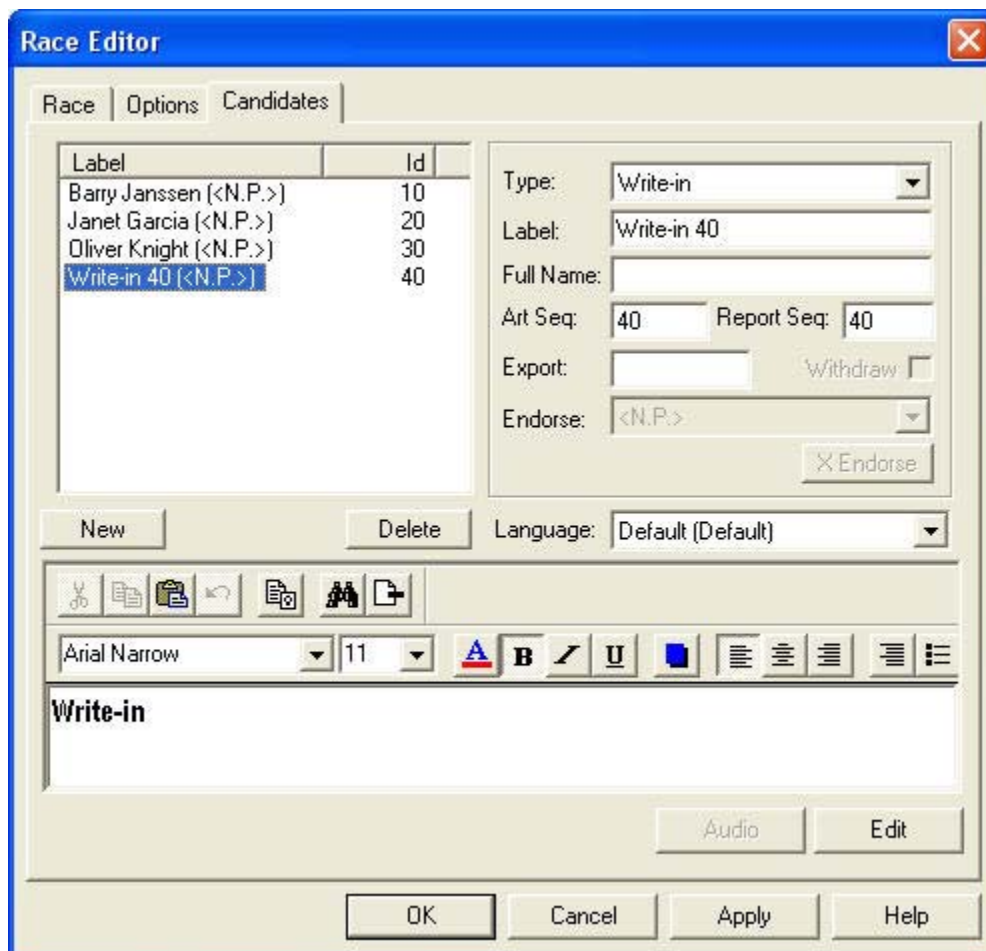


Figure 4-7. Deleting a district

- i. Click on the X Endorse button.
 - ii. Endorse the second partisan instance of the candidate.
 - iii. Continue cross-endorsing candidates in this manner, until all partisan instances of the cross-endorsed candidate have been defined.
- i. For every language defined in the election:
 - i. Select the applicable language from the Language drop-down list.
 - ii. Using the formatting tools and options available, enter candidate text for the language in the ballot text field at the bottom of the Candidates tab.
 - iii. Click on the Audio button in order to record, import, or format audio information corresponding the candidate/language combination.



Label	Id
Barry Janssen (<N.P.>)	10
Janet Garcia (<N.P.>)	20
Oliver Knight (<N.P.>)	30
Write-in 40 (<N.P.>)	40

Type: Write-in

Label: Write-in 40

Full Name:

Art Seq: 40 Report Seq: 40

Export: Withdraw ☐

Endorse: <N.P.> X Endorse

New Delete Language: Default (Default)

Write-in

Audio Edit

OK Cancel Apply Help

Figure 5-4. Race Editor - Candidates tab

46. Once all candidate definition is complete, click on the Add button to continue adding races in the election. At the completion of the last race, click on the OK button.

5.2.4. Voter groups

47. For each voter group to appear in the race:
 - a. Select the voter group in the top, right-hand list, and click on the Add button. The political party now appears in the top, left-hand column.



- Change race and header formatting information
- Alter language-related ballot text
- Save results

The Ballot and Card Editors display AccuVote-OS ballot artwork without precinct identifiers or control marks, such as cut marks. Note that while ballot artwork appears in AccuVote-OS ballot format only, these editors may also be used to preview AccuVote-TS ballot artwork.

Activate the Ballot Editor by double-clicking on a ballot style or ballot. Activate the Card Editor by double-clicking on a card style or card.

Ballot Editor
Ballot Edit View Height Zoom

11 14 17 18

Card 1:1 Default

Races

Headers

ELECTION
BACK
PARTISAN
SCHOOL
LASSEN BOARD OF ED
LASSEN COMM COLLEGE
LASSEN UN HIGH SCHOOL
BIG VALLEY JT UNF
FT SAGE JT UNF
JANESVILLE UNION ELEM
JOHNSTONVILLE ELEM
RAVENDALE-TERMO ELEM
RICHMOND ELEM
SHAFFER ELEM
SUSANVILLE ELEM
WESTWOOD UNIF
MODOC JT UNIF
DISTRICT
LMUD
LASSEN COMM HEALTH CARE
MAYERS HOSPITAL
SUSANVILLE SANITARY DIST
SUSANVILLE LIBRARY DIST
CLEAR CREEK CSD
LEAVITT LAKE CSD
LITTLE VALLEY CSD
SPALDING CSD
W PATTON VILLAGE CSD
WESTWOOD CSD
BIG VALLEY FIRE
DOYLE FIRE
JANESVILLE FIRE
LAKE FOREST FIRE
MADELINE FIRE
NW LASSEN FIRE
STANDISH-LITCHFIELD FIRE

**OFFICIAL BALLOT
CONSOLIDATED GENERAL ELECTION
COUNTY OF LASSEN
TUESDAY, NOVEMBER 7, 2000**

INSTRUCTIONS TO VOTERS
1. To vote you must completely darken the oval next to the candidate or measure of your choice. If you mismark an oval or change your mind, exchange your ballot for a new one.
2. To write in a name, you must completely darken the oval to the left of the line provided and write in the name on the line provided.
3. All distinguishing marks or erasures are forbidden and make the ballot void.

PARTISAN

**PRESIDENT AND VICE PRESIDENT
Vote for ONE Party**

☐ JOHN HAGELIN for President Natural Law
☐ NAT GOLDHABER for Vice President
☐ HARRY BROWNE for President Libertarian
☐ ART OLIVIER for Vice President
☐ GEORGE W. BUSH for President Republican
☐ DICK CHENEY for Vice President
☐ PATRICK J. BUCHANAN for President Reform
☐ EZOLA FOSTER for Vice President
☐ HOWARD PHILLIPS for President American Independent
☐ J. CURTIS FRAZIER for Vice President
☐ AL GORE for President Democratic
☐ JOE LIEBERMAN for Vice President
☐ RALPH NADER for President Green
☐ WINONA LADUKE for Vice President

**STATE SENATOR
1st District
Vote for ONE**

☐ THOMAS "RICO" OLLER Republican Businessman/State Legislator
☐ JON PETERSEN Libertarian Computer Consultant
☐ THOMAS "TOM" ROMERO Democratic Public School Educator

**Governing Board Member
Trustee Area No. 5
Vote for ONE**

☐ RUTH B. YOCHEN Retired Teacher/Optician
☐ LD. "DOC" BLEVINS Businessman/Retired Educator

WESTWOOD UNIFIED SCHOOL DISTRICT

**Governing Board Member
Full Term
Vote for no more than TWO**

☐ BENNY W. WALLACE Businessman
☐ SCOTT KELLY Real Estate Appraiser
☐ DAWN B. LEE Massage Therapist
☐ ROBERT HILL Attorney

**MEMBER OF STATE ASSEMBLY
3rd District
Vote for ONE**

☐ BENJAMIN WIRTSCHAFTER Democratic Attorney
☐ WILLIAM L. THOMASON Libertarian Accountant
☐ SAMUEL H. AANESTAD Republican Member of Assembly

**UNITED STATES SENATOR
Vote for ONE**

☐ BRIAN H. REES Natural Law Physician
☐ GAIL KATHERINE LIGHTFOOT Libertarian Registered Nurse
☐ JOSE LUIS "JOE" CAMAHORT Reform Consulting Scientist/Engineer

SCHOOL

LASSEN COMMUNITY COLLEGE DISTRICT

**Governing Board Member
Short Term Expiring Dec. 6, 2002
Vote for ONE**

☐ RHONDA SANDERS Marina Employee/Parent
☐ SHIRLEY R. BARBER School Career Specialist

Figure 6-21. Card Editor

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**IN THE UNITED STATES DISTRICT COURT
FOR THE NORTHERN DISTRICT OF GEORGIA
ATLANTA DIVISION**

**DONNA CURLING, ET AL.,
Plaintiffs,**

v.

**BRAD RAFFENSPERGER, ET AL.,
Defendants.**

Civil Action No. 1:17-CV-2989-AT

DECLARATION OF J. ALEX HALDERMAN

J. ALEX HALDERMAN declares, under penalty of perjury, pursuant to 28 U.S.C. § 1746, that the following is true and correct:

1. The GEMS database itself is not sensitive and the State should be able to produce it subject to minimal security precautions, such as sending an encrypted copy via email with separate password to follow.

2. GEMS is the Global Election Management System, a Windows application that election workers use to create ballot layouts, program voting machine memory cards, and aggregate election results from multiple voting machines. Data produced and processed by GEMS is stored in a Microsoft Access database file, the GEMS database.

3. Detailed information about the operation of GEMS and the structure of the GEMS database is already part of the public record. Several states make their

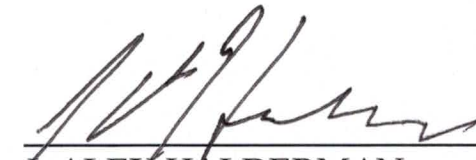
GEMS databases public, as a matter of transparency. The GEMS software itself has been available for download from the website BlackBoxVoting.org for more than 13 years, along with abundant technical documentation about the program. Experts have published several security analyses that detail vulnerabilities in the GEMS software. Were information from Georgia's GEMS database to be revealed, it would not create any greater security risk than already exists by virtue of this publicly available information.

4. Defendants assert that the "structure" of Georgia's GEMS database is unique to Georgia, and that its disclosure would therefore aid attackers. This reflects a misunderstanding of how election-specific malware can operate. Malware does not need to be hard-coded for a specific race ID code or candidate number (which might be unique to a particular state). Instead, it can be programmed to search for the name of a candidate or political party, regardless of how that candidate or party is coded in the database. In any event, files that appear to be GEMS databases from certain past elections in Georgia have long been available online at <http://blackboxvoting.org/docs/diebold/marks-gems-files.zip>. If there are characteristics that are unique to all GEMS databases used in Georgia, those characteristics are likely already ascertainable by attackers through analysis of these publicly available files.

5. Examining the GEMS database will allow Plaintiffs to begin investigating whether errors or attacks have impacted past Georgia elections. Such examination has the potential to uncover a range of problems, including errors in ballot preparation, software bugs and misconfigurations, data corruption, mistakes during tabulation, and certain forms of malicious software. Any of these problems could have resulted in anomalies in past elections and could recur in future elections.

6. A review of reports generated by the GEMS software cannot substitute for an examination of the database itself. These reports contain only a subset of the information contained in the GEMS database. While the GEMS database is the actual data and coding used to operate the election, the reports are merely an approximate translation and summary, rendered into human-readable form by GEMS itself. Like any translation, the reports necessarily omit subtleties and nuances that can affect the meaning of the information. Moreover, since the reports are produced by the GEMS software, errors or malware affecting the GEMS system could cause crucial information to be omitted from the reports.

I declare under penalty of the perjury laws of the State of Georgia and the United States that the foregoing is true and correct and that this declaration was executed this 1st day of July, 2019 in Ann Arbor, Michigan.



J. ALEX HALDERMAN